Volume 13, No. 2 **March, 1958**

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Conservation in the Great Plains
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Improving Public Understanding of Water Problems and Policies
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Wildlife and Water Conservation
. . . CLARENCE COTTAM

What Women and Children Can Do to Promote Soil Conservation
. . . MARY KENNINGTON

Field Notes / Reviews and Literature Briefs
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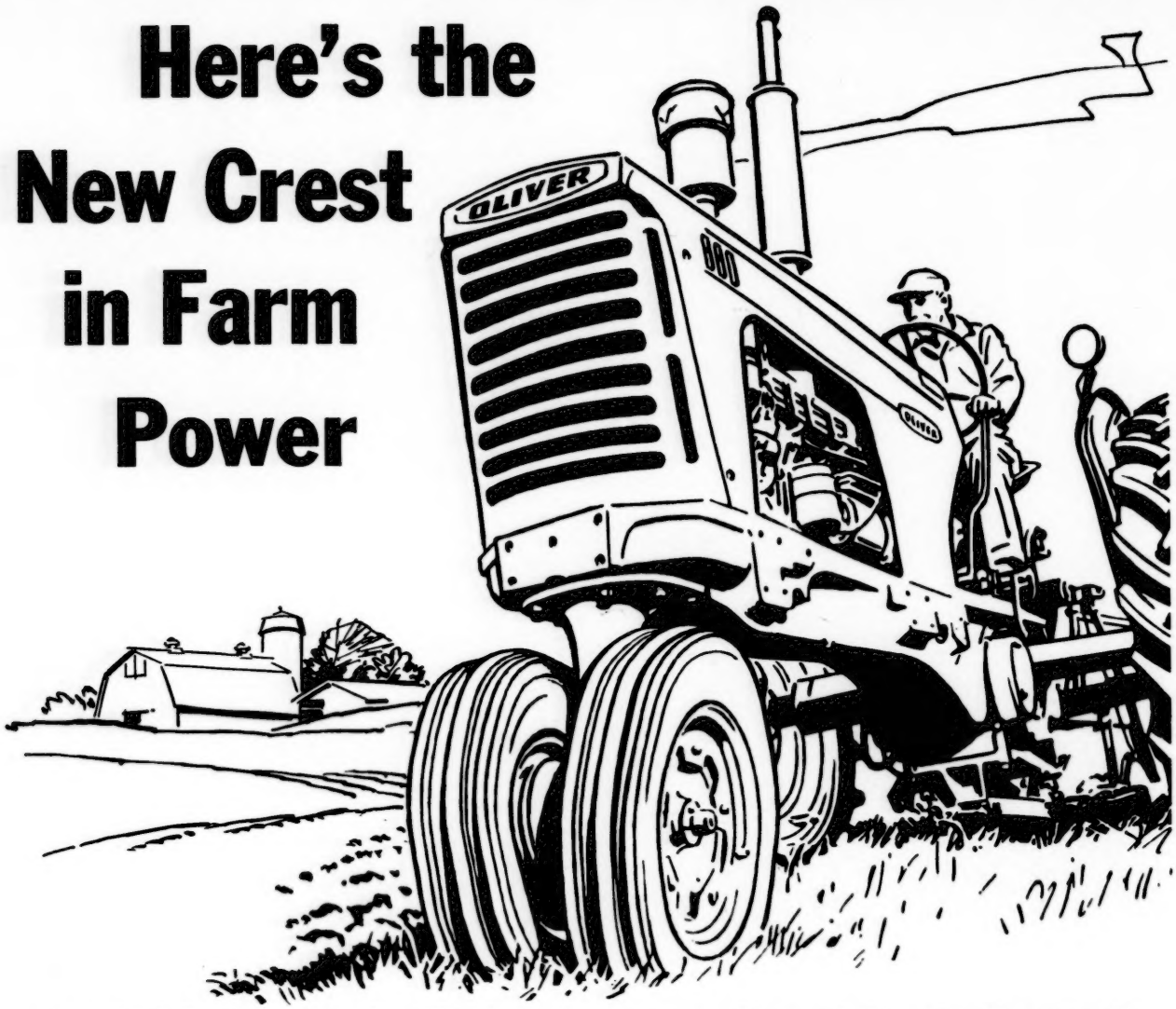

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Journal of SOIL AND WATER CONSERVATION

VOLUME 13
NUMBER 2

TO ADVANCE THE SCIENCE AND ART OF GOOD LAND USE

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COVER: The planting of a tree can be a deceptively simple act. However, behind the planting of trees there is an unfolding of eons of inter-relationships and toil and memories of human beings. And, there is the future.
(Wisconsin Conservation Department photograph.)

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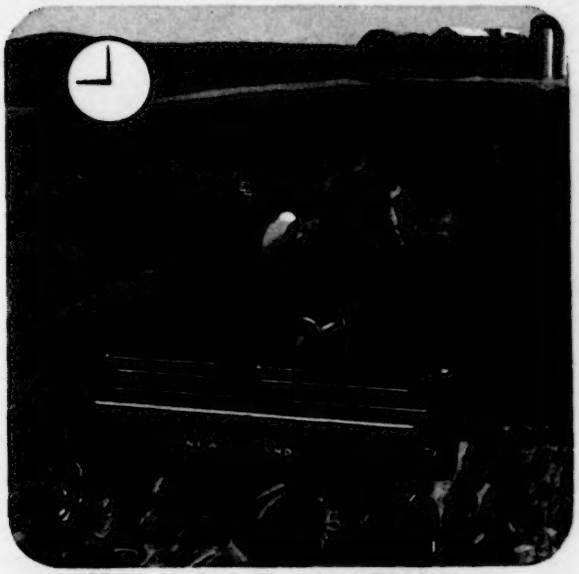

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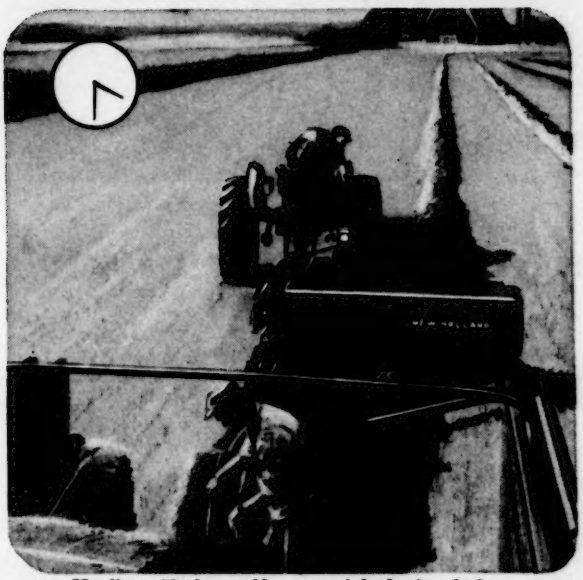

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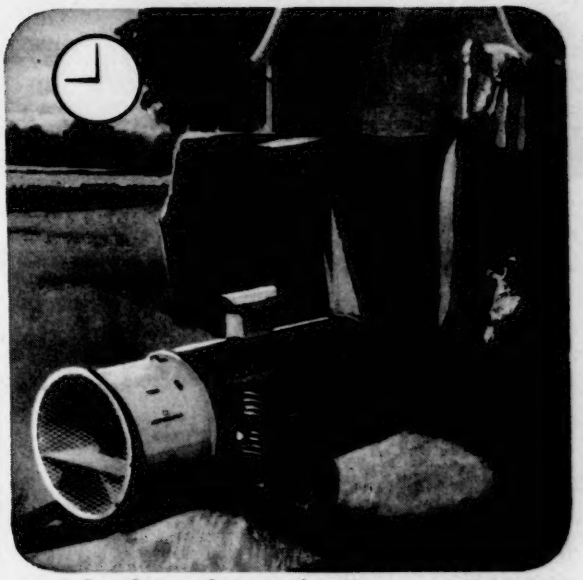

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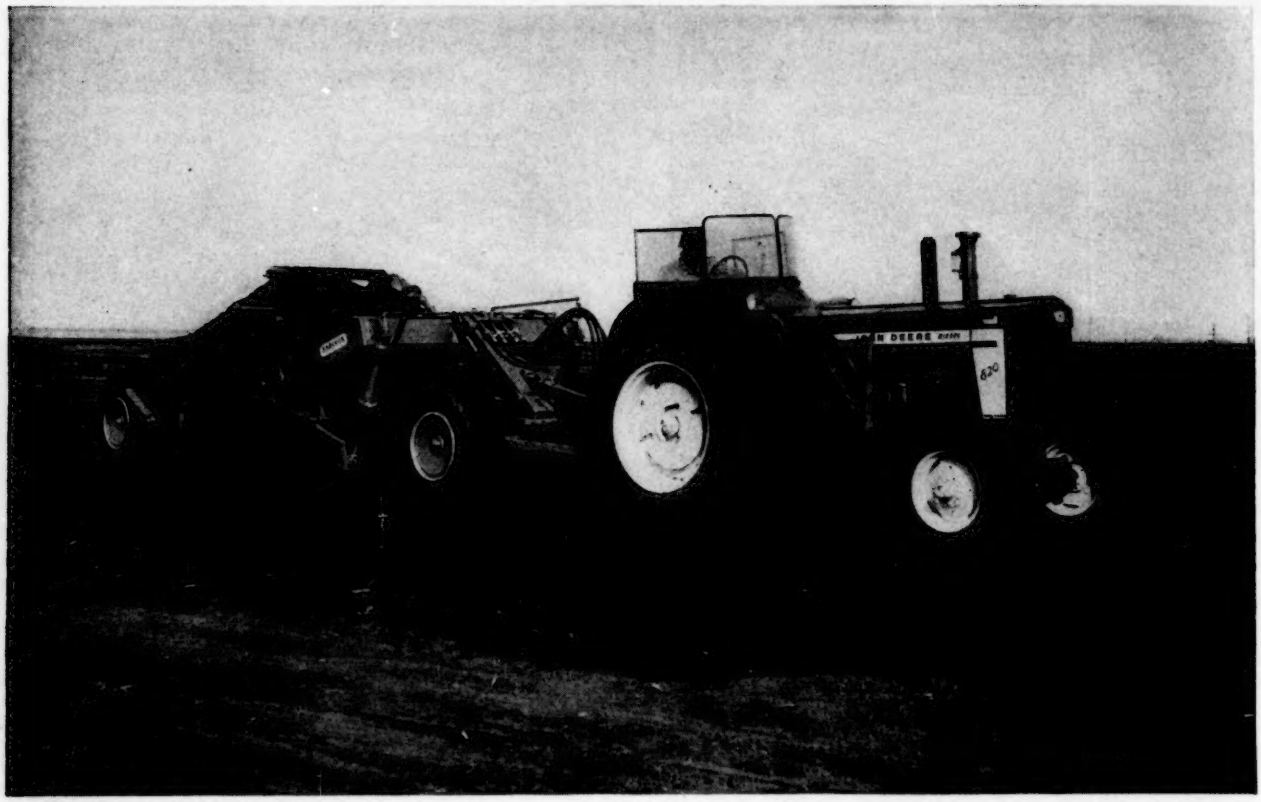

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The Conservation Reserve Program Promotes Good Land Use

J. K. VESSEY

Conservationists are conscious of the pressing need to accelerate the program of good land use in America. They can derive much satisfaction from the fact that the nation has adopted the sound principles inherent in the Conservation Reserve phase of the Soil Bank Act. Application should help to ease some economic pressures resulting from surpluses of the basic agricultural crops. With the widening public understanding of the true concept of conservation as a philosophy of life and a means for perpetuating our renewable natural resources, it was inevitable that such measures would eventually be incorporated in the nation's farm program. The Conservation Reserve practices give realistic recognition to the desirability of a long-range program incorporating multiple-use of the land in accordance with its capabilities and needs. It is a double-barrelled program and both barrels are potent!

THE CONSERVATION RESERVE PROGRAM provides a realistic and practical basis for reducing the production of currently unneeded agricultural products and it creates incentive for converting the many cultivated acres on America's farms, which admittedly are not good cropland, to uses more in keeping with their capabilities and needs; *i.e.*, for grass, for trees, for wildlife habitat. Figuratively speaking, this is a program where the landowner and his supporting public might very well "give 'em both barrels!"

The potentialities of the Conservation Reserve phase of the Soil Bank Act were very little understood or recognized in the early stages of the program. Its more glamourous but controversial sister, the Acreage Reserve, got most of the attention for obvious and understandable reasons. Full participation in the Acreage Reserve Program would make the most direct curtailment of critical surplus crops; its application is in keeping with the understanding and philosophy of farmers; it is relatively simple in sign-up procedures and administration and it is operated on a short-time basis. Landowners are not committed for more than a year in advance. On the other hand, qualification under the Conservation Reserve has more facets to it and at first it was less readily understood. In addition, there is the psychological handicap in making long-term commitments up to 10 years.

As the Conservation Reserve has become better understood by the administrators, technicians, landowners and interested public, it has grown in stature to the point where it is now a most practical and worthwhile phase of the Soil Bank Act. Its goals are recognized as being worthy of public support and financial participation. Landowners by the thousands are recognizing the worthiness of the program and are availing themselves of this incentive to take immediate steps to put their less productive land into grass, trees and other cover suitable for wildlife habitat.

The farmers and ranchers who have or intend to participate in the Conservation Reserve are definitely aligning themselves with the growing conservation movement and are making definite contributions toward helping to assure the future of our renewable natural resources.

J. K. Vessey was Assistant Regional Forester, U. S. Forest Service, Milwaukee, Wisconsin, when this article was prepared. He is now Regional Forester for the Southern Region with headquarters at Atlanta, Georgia.

LAND, forest and water management closely integrated, builds a strong nation.

Gutted acres like these need a permanent cover such as available under the CONSERVATION RESERVE PROGRAM.

RURAL SLUMS are a national as well as a local problem. Retiring such lands from agricultural production helps everyone.

There continues to be a need to shed more light and focus more attention on the Conservation Reserve and its potentialities.

A few words about how the program operates:

When a farmer, rancher or other qualified landowner decides to participate in the Conservation Reserve Program, he enters into a contract with the Secretary of Agriculture in which the Secretary, through the County Agricultural Stabilization and Conservation Committee (ASC), agrees to provide two types of payment to the landowner:

1 Cost Sharing for Establishing Practices

Up to 80 per cent of the cost of establishing the practice as determined and approved by the State ASC Committee.

2 Annual Land Rental

Rates vary by counties and states, but the national average is about $10 per acre per year extending over the term of the contract.

In turn, the farmer or landowner agrees to:

a/Comply with any acreage allotments in the six critical crops . . . wheat, corn, cotton, rice, peanuts, tobacco.

b/Maintain the selected practice on the land placed in the Conservation Reserve for the duration of the contract. Contracts run from three to five or ten years if there is acceptable land cover already on the land, five to ten years if legumes are established, five to ten years for tree and shrub plantings for specific erosion control areas and wildlife habitat plantings, and ten years for tree plantings primarily for the production of wood products.

c/Refrain from harvesting or otherwise utilizing the production from the land under contract except wildlife. (No Christmas trees, greens or boughs can be harvested.)

d/Protect the areas from grazing and wild fire.

e/Control the spread of noxious weeds.

In general, eligible land includes all areas previously used for cultivated crops or tame hay. The ASC personnel administering the program establish a "base acreage" figure for each farm computed on the history of operation. There is no limitation on the maximum number of acres that can be "banked," but $5,000 is the maximum permitted a farmer in annual payments during any one year.

The Conservation Reserve Program is administered from the office of the Secretary of Agriculture by the Agricultural Conservation Program Service. Execution of the program on the ground is through the Department's Agricultural Stabilization and Conservation Agency, with technical assistance provided by the Soil Conservation Service and the U. S. Forest Service with the cooperation of the state foresters. The Extension Service has the important responsibility for providing farmers with information regarding the availability of the program.

Only wildlife should roam the woods.

Modern tree planting is efficient. A farmer can get cost-sharing for tree planting and annual payments under the CRP. Farm foresters provide technical assistance.

This boy is fortunate that he has such a wise father. FATHER, SON AND TREES—an investment in the future.

The 1958 Conservation Reserve Program encourages farmers and landowners to place entire farms in the "Soil Bank" and places a special emphasis on increasing tree plantings. When all of the eligible land on the farm is retired from agricultural production and is planted to trees, county ASC committees are authorized to increase annual payment rates, where such increases are justified. Five- and ten-year contracts are offered, at the option of the farm owner, when land is devoted to tree or shrub plantings for windbreaks, shelterbelts or wildlife habitat development. Ten-year contracts are required when trees are primarily for the production of wood products.

It is becoming increasingly evident that tree planting is a popular conservation choice by farm landowners who sign up for the Conservation Reserve. This popularity is undoubtedly based on the fact that landowners realize wooded areas provide multiple-use by protecting the soil from erosion, regulating the infiltration and flow of water, providing suitable habitat for wildlife and at the same time producing valuable crops of needed wood products.

The community and the nation share with the farmer in the benefits that are to be derived from trees and shrubs planted on his diverted cropland acres. Well-managed woodlands in combination with other recognized good soil practices on the farm are a key factor in regulating the quantity and quality of water from farm watersheds which is of inestimable benefit to downstream users. A farmer seldom, if ever, harvests the entire game crop which is produced on his land. Many others share in the harvest. Wood products produced on the farm not only provide income to the farmer, but create payrolls and profits to the people of the local community and the communities where the raw material is processed into final form.

It would be a mistake to overlook the fact that the Conservation Reserve is just one more tool for advancing the needed conservation program in the nation.

Trees are a crop not in surplus. The harvest can be delayed.

The farm woodlot provides off-season work and a cash income.

The extent to which farmland owners participate in this particular program must be determined in the light of the hard fact that their farm unit is their main source of livelihood. It is a fixed geographical unit which cannot escape the influence of its location, climate and economic environment. Any cash crop curtailment or diversion in the interest of desirable conservation practices must be compatible with the owner's economic needs. The Conservation Reserve Program provides a financial incentive which will make it possible for an owner to participate in conservation measures to a greater extent than would ordinarily be possible. It is important that each farmer consider the opportunities and advantages provided by the Conservation Reserve Program and avail himself of those opportunities based on his particular situation in terms of his short and long term goals. Participation in the program is voluntary. The final decision rests with the farmer.

It behooves all who are working in the field of natural resource conservation to make whatever effort is necessary to encourage farmland owners to avail themselves of maximum personal benefits and make important contributions to the public good through participation in the Conservation Reserve. It is an effective tool that can be enthusiastically embraced alike by landowners and the public which is the eventual beneficiary.

Their future depends on the forest around them.

The rippling waters of good land use benefit all.

Conservation in the Great Plains

J. W. TURELLE

The Great Plains comprises 350,000,000 acres and is subject to extreme climatic conditions. Droughts, dust storms, intense rainstorms, and high summer temperatures have been features of the Great Plains for centuries. Public Law 1021, enacted by the 84th Congress, authorizes the U. S. Department of Agriculture to provide farmers and ranchers financial and technical aid. The purpose is to achieve a more stable agriculture based upon proper land use and soil and water conservation for the entire farm or ranch participating in the Great Plains Conservation Program.

PRESIDENT DWIGHT D. EISENHOWER has this to say about the Great Plains area:

"The Great Plains region, a vast agricultural empire peopled by 17 million of our citizens, is an area of severe climatic variations which periodically produce widespread suffering and heavy economic losses. In this region, farm families have a continuous struggle to protect their best cultivated and grazing lands against soil erosion during seasons of high winds and frequent periods of extremely dry weather.

"Because these problems directly concern the lives and prosperity of million of American citizens, the nation as a whole is directly concerned. Because all Americans are concerned with the maintenance and improvement of our soil and water resources, every citizen in the land has an interest in the solution of agricultural difficulties in the vast Great Plains area."

Congress has responded to this problem by enacting a law which provides farmers and ranchers with a new tool to help them avert many of the hazards that come with the recurring droughts and high winds common to the region.

The new tool is the Great Plains Conservation Program, Public Law 1021, passed by the 84th Congress. It provides for *long-term* technical and financial help from the U. S. Department of Agriculture to individual farmers and ranchers. This help, designed to build a stable agriculture for the Great Plains, includes:

1 Technical aid in developing and carrying out a conservation plan including land-use changes and combinations of conservation practices that the individual selects from alternatives that will provide the most enduring conservation benefits and stability to his entire farm or ranch.

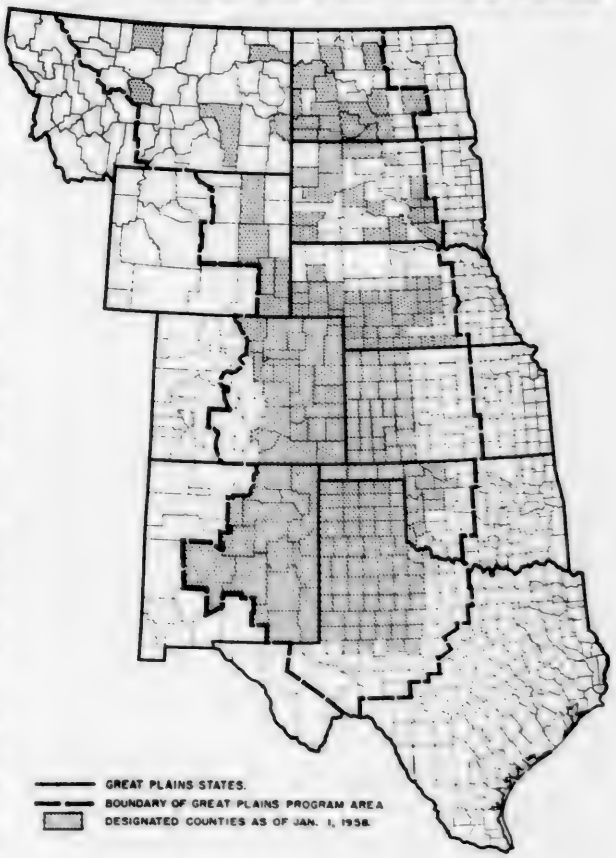
2 A long-term contract with the individual under which the Secretary of Agriculture will make *advance commitments* to share with the individual the cost of establishing the combinations of conservation practices decided upon in his plan. The contract may cover the minimum period required by the individual to carry out his plan and may range from 3 to 10 years.

The principal basic policies in effect are:

1/Emphasis on land-use changes, wind erosion control, moisture conservation and management practices for the purpose of obtaining enduring conservation benefits and stable agriculture.

2/It is voluntary on the part of the farmer or rancher.

Figure 1.
THE GREAT PLAINS and "DESIGNATED" counties of the Great Plains Conservation Program.



J. W. Turelle is an agronomist, Northern Great Plains, in the Soil Conservation Service with headquarters at Lincoln, Nebraska.

3/A contract for the entire unit based upon an acceptable time schedule for land-use shifts, if any, and land treatment, is a requirement to participation in the program.

4/It is an addition to existing conservation programs.

5/The farmer or rancher is responsible for developing and carrying out an approved conservation plan.

6/Farm acreage allotments are protected while the farmer or rancher carries out his needed land-use shifts.

7/Land may be used for grazing or other purposes, if seeded down to vegetative cover under the contract, as long as such use is consistent with good management.

8/Provides an opportunity for local organizations, such Soil Conservation Districts and ASC Committees, to better utilize their existing programs.

9/The Secretary of Agriculture establishes the regulations for the operations of the program, and the Soil Conservation Service is responsible for its administration.

10/Under the leadership of the Soil Conservation Service, the following agencies assist in developing and reviewing policies and general operating procedures for the program: Agricultural Conservation Program Service, Agricultural Marketing Service, Agricultural Research Service, Commodity Stabilization Service, Farmers Home Administration, Federal Crop Insurance Corporation, Federal Extension Service, U. S. Forest Service, and the U. S. D. A. Office of Information. Where these agencies have representatives at the state and county levels, they constitute the State and County Program Committees under the chairmanship of the Soil Conservation Service.

11/The maximum cost-shares do not exceed 80 per cent of the average cost of installing each eligible conservation practice.

12/Federal cost-shares are paid to the producer after he has carried out an identifiable unit of his conservation plan.

Public Law 1021 authorizes appropriations not to exceed $150,000,000 for a period ending December 31, 1971. It provides that cost-sharing payments to farmers or ranchers in any one year will not exceed $25,000,000. Congress appropriated $10,000,000 for the fiscal year 1957-1958. This is the first appropriation made for this program. There are some cost-share limitations: "Federal cost sharing in excess of $2,500 will not be made for any structure [for irrigation water] installed under this conservation practice." Some states also impose a ceiling on other practices.

The Great Plains Conservation Program is applicable in designated areas within a vast 350-million-acre region that comprises parts of Montana, Wyoming, Colorado, New Mexico, Texas, Oklahoma, Kansas, Nebraska, South Dakota and North Dakota. At the time of this writing, the Secretary of Agriculture has designated approximately 243 counties for participation in this program. Fig. 1 outlines the Great Plains area included in this program and most of the counties which have been "designated."

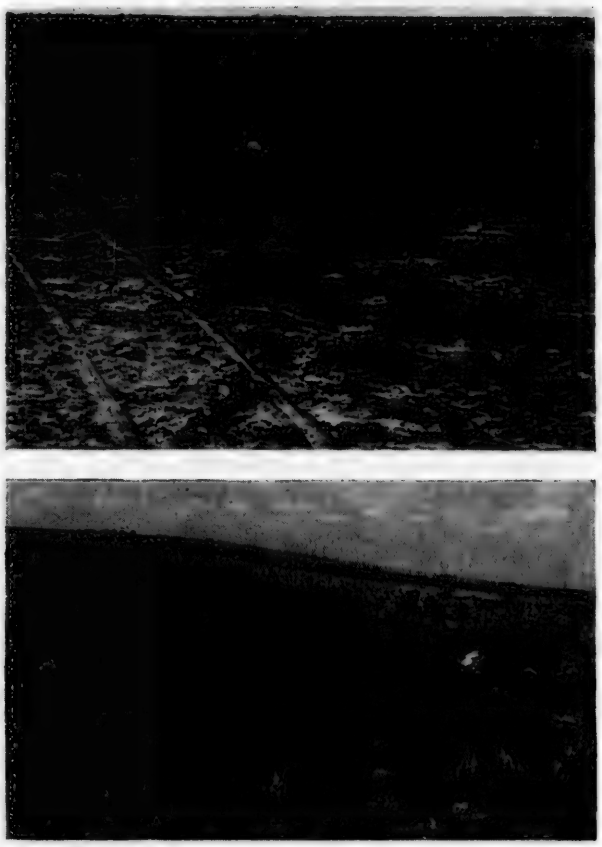


Figure 2.
Drought stricken, but in three years' anchored down by a native grass mixture. An example of land-use adjustment in the Southern Great Plains.

Farming and ranching in the Great Plains has never been easy. This is a land of reluctant rainfall. And when it does rain, a month's quota, or even a summer's quota, may fall within a few days or a few hours.

Droughts are a normal feature of the climate and must be planned for in any agricultural enterprise.

This is a land of high summer temperatures and persistent winds. Its soils are productive when moisture is available, but they easily blow away or wash away when vegetative cover is lacking.

Economic distress has resulted from severe damage by wind erosion on about 135 million acres. Soil surveys made on thousands of acres in the Great Plains by the Soil Conservation Service indicate that 11 to 14 million acres now cultivated should be planted to permanent grass. In addition, several million acres now cultivated

produce crops only in the exceptionally good years and they, too, should be in grass most of the time.

The droughts and destructive winds that plague the Great Plains region can't be stopped. But farmers and ranchers can minimize the damaging effects of these natural disasters by developing conservation plans based on land capability and putting these plans into effect over a period of years. The Great Plains Conservation Program offers an opportunity.

Proper land use is the first and most important step in developing a conservation plan. It is based on the suitability of land for use without damage. Determination of suitability entails considering the hazards and limitations of a soil, including climate. Selecting proper land use for each field is partly a matter of deciding whether the land is suited for cultivated crops, pasture and range, woodland and windbreaks and wildlife. This involves studying the physical features of the farm or ranch. Physical features include degree of slope, susceptibility to erosion, unfavorable chemical conditions, soil depth, soil texture, physical condition of soil, and movement rates of air and water through the soil. Fig. 2 is an illustration of land-use adjustment.

When land use has been determined, the next step in developing a conservation plan is how to treat and manage the land to achieve the most conservation benefits.

Maintaining a plant cover on the surface is the heart of a conservation plan in the Great Plains region. Cover is the magic word, whether it be grass, other growing crops, or residues.

When cover is lacking, as during extended droughts, emergency tillage may check wind erosion temporarily if it is done properly and at the right time. But it gives only temporary relief, may be less effective if a second tillage is needed because it may not be as successful as the first in producing a cloddy surface, and should be used in emergencies only, as a stop-gap measure until plant cover can be grown.

Plant cover must be managed if it is to serve its purpose. Stubble mulching* is one of the key practices in maintaining cover. It is a practical, effective and economical way to control wind erosion. Stubble mulch should be used where soil drifting is likely to occur. This practice is extremely important when summer fallowing is used. Fig. 3 illustrates its effectiveness.

Grass, of course, is the best vegetative cover of the Great Plains. Erosion doesn't take place under good grass cover. And, if properly used, grass cover serves as a sponge; water soaks into the ground instead of running off.

Stubble mulch is a protective cover provided by leaving plant residues of any previous crop as a mulch on the soil surface when preparing for and planting the following crop.

Stubble mulching is a year 'round system of managing plant residues in which harvesting, tilling, and cultivating operations are performed in a way to keep most of the vegetative material on the surface of the soil until after the next crop is seeded.

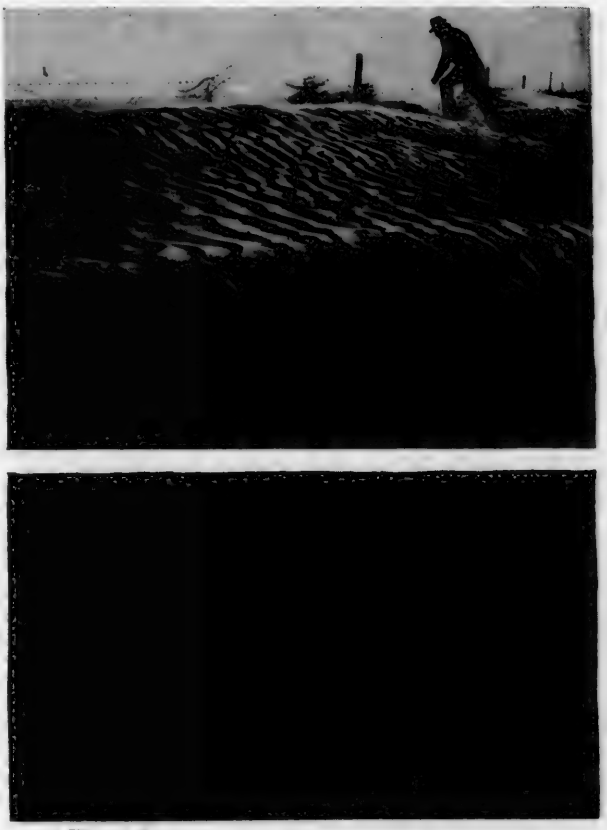


Figure 3.

Two fields about 600 feet apart in the Central Great Plains—one without surface protection, causing serious wind erosion and drifting along fence lines; the other with a protective stubble-mulch cover. Here is a most effective soil and water conservation practice.

In managing the dryland native or tame pastures of the Great Plains, the primary practice is constant adjustment of numbers grazed to bring about proper balance between the needs of the livestock for profitable year-to-year gains, needs of the soil for protection, and needs of the plants for vigorous growth. Additional practices needed to manage pastures properly include fencing, water developments, rotation grazing, deferred grazing, and building feed reserves.

Where possible, cropping systems should include a high ratio of close-growing crops. This provides a vegetative cover, either as a growing crop or in the form of residues when used in conjunction with stubble-mulch tillage. Grass and legumes, where applicable, should be used as much as possible in the cropping system. Fig. 4 illustrates the use of vegetative cover in a conservation cropping system.

A well-planned cropping system will help improve the physical condition of the soil. Better soil tilth lets more

Figure 4, *see above.*

A badly eroded cropland field in the Northern Great Plains. The same field 3 years' later, after it was leveled and seeded to hay. The hazards of wind and drought have been reduced.

air and water into the soil and lessens erosion and water losses.

Other practices that will receive full consideration in developing a conservation plan in the Great Plains region are grassed waterways, contour farming, stripcropping, terracing, windbreak plantings, and wildlife area improvement. Fig. 5 illustrates some of these practices.

Stabilizing agriculture and achieving a more dependable source of income in the Great Plains region is not an easy task, nor is it one that will be accomplished over night. The knowledge of how to reduce the damaging effects of climatic hazards is available, for agricultural technology has made many advances in the past 25 years.

This knowledge, plus the individual's will to "do something about" his land-use problems, plus full use of going conservation programs and the new Great Plains Conservation Program can, during the next decade, make the Great Plains a better and more rewarding place in which to live.

The Great Plains is a vital segment of the United States. This region normally produces 60 per cent of our wheat and 35 per cent of our cattle. It contains 37 per cent of our land area and 40 per cent of our cropland. It helped mightily to feed our people and our allies during two world wars. In truth, the continued progress and high standard of living of the American people depend in large part upon protecting and improving the land resources of the Great Plains.

Figure 5.

Several land treatment practices applicable to the Great Plains.

Improving Public Understanding of Water Problems and Policies

MARVIN A. ANDERSON

The problems of too much water, too little water—and clean water—have been problems since prior to the Christian era. Early in the development of this country and particularly in the Western United States, conflicts, confusion and uncertainty have surrounded the issue of water use. How adequate are the facts? How well do people understand the facts for the purpose of choice making in an aura of freedom?

THE FACT THAT WATER is essential to human life and well being does not in itself cause conflicts. Problems arise when water changes from a free and renewable resource to a scarce resource; a time when individuals and groups demand rights in the use of water. Society thus becomes concerned about the allocation of this scarce resource to alternate uses and users.

This concern involves understanding the alternate, complementary and sometimes competitive uses of water with respect to individual and group interests. The individual may demand assurance that he has certainty of use, at the same time society may wish to provide flexibility of use for the uncertain future.

In this setting education and public understanding become important. The need for these is seldom as keen as when conflicts of interest develop. In Iowa, legislation was enacted by the General Assembly in 1957 which regulates the uses of water. Permits are required where the use changes or exceeds a certain quantity. Three neighboring farmers made application to use water for irrigation. Prior to the hearing several groups registered protests: a nearby city concerned with water supply and sewage disposal; a recreation group; and the state Conservation Commission.

The farmers, who prior to this had made investments in irrigation equipment, were caught in a public conflict. Until this time and situation, only a general awareness of the water problems existed among the several groups and individuals. The issue was sharpened substantially when a rationing was contemplated.

Herein is an important point for those concerned with achieving public understanding of a problem: a need must be felt and a problem identified before educational programs have meaning or can be effective.

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He presented this paper at the annual meeting of the Soil Conservation Society of America, Pacific Grove, Calif., August 30, 1957.

It is impressive to observe and study the abundance of material available on water problems resulting from the efforts of government agencies, study commissions and non-public groups. It is even more impressive to note the lack of material or analysis as to how public understanding might be enhanced on this important problem even though behind each report and article is the unwritten objective of achieving information for use in understanding or settling issues on water problems.

Must Understand How People Accept Ideas

It is important to inquire how people gain understanding and acceptance of ideas. In fact, this is fundamental in the goal of obtaining public understanding. By examining how this is done in the case of a single practice or idea one can be better equipped for the broad educational task. This process has been the concern of many research workers. They suggest that this process is a sequence of thoughts or actions and not a unit act in itself.

Usually the decisions in the process of acceptance of an idea or practice are made after multiple contacts with various communication channels. An examination of this process of and forces responsible for acceptance is appropriate.

Rural sociologists have identified this process in the following stages:*

AWARENESS—A stage when the individual only knows of the existence of an idea or practice, but has little information about it

INTEREST—A stage when the individual seeks more information about the idea to consider its merits

EVALUATION—A stage when the individual makes a mental application with respect to his own situation

**G. M. Beal and J. M. Bohlen, The Diffusion Process, Special Report, No. 18, Ag. Ext. Service, Iowa State College, Ames, Iowa, March 1957.*

TRIAL—A stage of specific application and trial on a small scale, in an "experimental" frame of mind

ADOPTION—A stage of acceptance and continued use.

Research has shown that various educational forces or processes are effective in varying degrees in each of these different stages. For farm people these forces have been grouped as follows:

MASS MEDIA (radio, TV, newspapers and magazines)

NEIGHBORS AND FRIENDS

GOVERNMENT AGENCIES (S.C.S., Extension, Voc. Agr., A.S.C.)

SALESMEN, DEALERS, BANKERS, FARM MANAGERS.

With the knowledge of how people accept ideas and the forces that can influence acceptance, the question arises of where and how is the process started. An axiom frequently referred to by educators is "start with people where they are." But this is almost elementary beside the question of knowing "where they are." Because of age, experience, education and many other reasons it is obvious that our public is seldom in the same "grade" with respect to a single idea or practice. The public is not a homogeneous group in which understanding can proceed forthwith.

Assuming that the public we are dealing with does have a general awareness of a given problem, there is another factor which provides for variation, and this is the perceptive ability of groups of people. Although the research in this area is sketchy, it has been hypothesized that among farm people the perceptive ability may be grouped as follows:

About 10-15 per cent of the population can handle abstract ideas and directly make applications. This may involve for example the use of a research publication

From 40-60 per cent of the population needs to see and examine carefully before the adoption of an idea

About 10 per cent of the population moves or changes practices only in the traditional pattern.

This grouping supports the occurrence of differential rate in which ideas or practices are accepted with a given effort. It also gives clues as to methods to be used to improve understanding of a particular segment of society. It also suggests the idea of differential programming and a continuous programming rather than the single campaign effort.

There is another important hypothesis related to practice or idea acceptance. This is the suggestion that functionally related ideas or practices are accepted at a relatively faster rate. Water conservation for example is closely related to other resource use practices; irrigation is related to industrial uses, both are production increasing. Thus, clues as to the content and method can be obtained when working with groups with an idea or practice which is associated with one already accepted.

There is no argument that the acceptance of ideas or practices comes about more rapidly when some plan of information and education is formulated. Reference has

A well-prepared small watershed exhibit deserves wide use through media of radio, newspapers, and magazines. Through another mass-media, TV, several programs can be based on such an excellent exhibit.

To many people the kinetic force of the raindrop is an abstraction. There are abstractions in floods, droughts and duststorms.

A technician and land-owners translate abstractions into real plans for a small watershed. These district leaders have arrived at the "trial" and "adoption" stage.

been made to the forces or agents which can bring ideas to the attention of the potential user. Among these forces we identify the leader as most important and necessary to any educational or "public understanding" endeavor.

Leaders are of three types (1) **the formal or expected leader** (sometimes referred to as an institutional leader), as for example Extension or Soil Conservation Service workers; (2) **the self-constituted leader,** one who enjoys the "badge" of leadership and is engaged in activities of many organizations and projects; and (3) **the informal leader** whose range of influence may be narrow and indeed may be almost invisible to a formal leader.

Any plan must provide for the use of each type of leader. The more complex the idea the greater the need for good understanding among each. Too often in our haste or impatience to gain public understanding of projects, we neglect the use of the informal leader. **Research evidence shows that the informal leader is a key in gaining acceptance on a broad front.**

Understanding Water Problems Complex

Achieving understanding of water problems and policies is infinitely more complex than the principles outlined in the acceptance of a single idea or practice. The following questions illustrate the point: How can water be used in irrigating crops? Should water be used for irrigation or industry or as a reserve for human consumption?

The answers to the second question are infinitely more complex than to the first.

The issues or controversy in uses of water arise in two areas: lack of facts for present and future supply and uses; and the nature of the ends to be served.

Through meetings such as sponsored by the *Soil Conservation Society of America,* additional facts on water are being assembled. Other organizations and agencies are and have been giving attention to technical, legal, social and economic considerations of water. Many areas can be identified where additional facts are necessary or desirable on the supply and demand side of water use. It is well that we be concerned about the sufficiency of facts; this is important in any effort of public understanding. We should not be deterred from moving forward with the information at hand, with specific plans for gathering additional information. In a dynamic society and economy there will always be a need for additional and refined information.

The second area of conflict is found in the objective or ends to be served. Here problems arise out of the competitive uses for water, for example in irrigation and navigation, recreation and industrial use.

Resolving conflicts in a democratic society is a slow and somewhat painful process. It is one that requires an understanding of the art of reaching compromises both for individual and group interest and the public good. Although individuals and groups have a diversity of views, there are almost always some common interests and objectives. Compromises necessitate the sharing together of common points of view and differences.

Situations of conflict-compromise are most often reflected in organized groups. These groups are forces which provide a powerful influence on the decision-making process. Groups, in many instances, organize to provide protection or to influence policy in the interest of their members. From their point of view they have an interest in improving public understanding. They do serve a most

useful purpose in ferreting out and focusing on the issues. They are expected to and do take a position.

There are many groups and organizations which have an interest in water policies and problems. Improvements in general understanding can be achieved when these groups are well informed and their objectives are understood.

Where is The Starting Place?

But where is the starting place in supplying information in resolving conflicts?

In public issues such as the water problem the educator has a most important role. This role is not one which prescribes "what should be" but is concerned with assembling, interpreting and distributing facts that can be useful to private and public individuals and groups. **This role is one that must relate the facts to the various ends to be served in a manner that decision and action can result.** Educators as a group fulfilling their role cannot be concerned that a specific policy or program is adopted. Their concern rests in the adequacy of facts and how well people understand facts for the purpose of choice making.

A Job For All Units of the Government

Water problems and policies of the United States are of such a broad nature and so complex that units in each subdivision of government might well consider the problems within their own frame of reference. Numerous such programs have been conducted or are underway. One example in Iowa of such an effort serves to illustrate how a plan for achieving understanding utilizes some of the ideas and principles outlined above.

Iowa courts historically have rendered decisions for conflicts in water use. It was only a decade ago, though, that general concern for water use became a broad public issue. Increasingly, competitive uses of water for irrigation, industry, recreation and human consumption suggested an examination of the problem and review of choices.

The highlights of activity in Iowa towards increasing public understanding (and decision making) are:

1/Creation of a National Resources Council by the General Assembly in 1949

2/Establishment of a Water Study Committee of water rights and drainage law by General Assembly in 1955; with public hearings 1955-56 and a report prepared for the legislature in December 1956

3/*Farm Policy Forum* published by Iowa State College Press devoted its fall 1955 issue to **Water Policy**—this magazine has state and national distribution

4/Public policy discussion conducted in all parts of the state by Agricultural Extension Service during fall and winter 1955-56 (leader training meetings)

5/Seminar on Iowa Resources sponsored by Agricultural Law Center of State University of Iowa and the Division of Agriculture, Iowa State College: six broad areas of the problem were discussed by federal, state and local representatives. A printed report of this seminar, entitled, **Iowa Water Resources,** was published July 1956 and distributed to "formal" leaders in the state

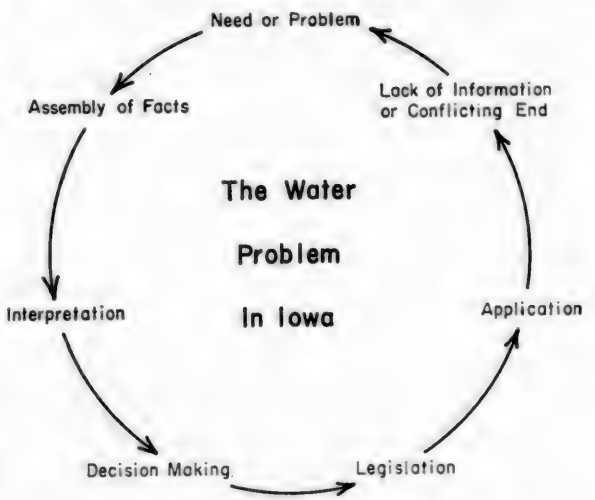
6/Publication of a popular bulletin from the seminar report entitled **The Water Problem in Iowa** (January 1956) with general distribution to county extension offices for local discussion groups

7/Water problems discussed by agency groups, farm organizations, municipalities and conservation groups aided by leadership groups. Mass media approach created awareness and understanding of the water problem, fall 1955 to 1957

8/Enactment of new water law by the General Assembly 1957

9/Public discussion arising from legislative action 1957.

This outline serves to suggest that attainment of the "action level" is seldom completed. This is illustrated:



Public Understanding Is Achieved By . . .

Improved public understanding of water problems and policies can be achieved by an organized plan built on the knowledge of individual and group processes related to acceptance of ideas. But adequate and sufficient information from the technical point of view is needed so that choices may be made and related to the end to be served. Recognition must be given to the process by which understanding is achieved—the many and varied forces which can aid in bringing about understanding.

Legislative action often follows choices made on public issues. Efforts to improve public understanding must be patterned to suit changing times, but must be based on enduring fundamentals. Education thus is placed in a setting of changes and adjustments.

Wildlife and Water Conservation

CLARENCE COTTAM

Good soil and water conservation is no less a prerequisite for sustained and successful agricultural crop yield than it is for wildlife production. Wildlife is a product of the land just as much as is corn, cotton or livestock.

Poor hunting and fishing are as characteristic of poor land as are the scanty agricultural crops produced. Wild animals abhor wornout, eroded and abandoned farm land because of inadequacy of food and cover and because the mineral fertility of food nutrients is too low to sustain them in health. Successful wildlife management must start with the soil. Good soil and water conservation, therefore, is inseparable from sound wildlife conservation.

EFFECTIVE AND SUCCESSFUL WILDLIFE (including fisheries) management must be an integral part of good land and water management. If we are properly to serve our people this must become the concern of all who administer or work with the land, and it must be ecologically sound. Management and planning, both for agriculture and wildlife, must be based upon the inherent suitability of the soil and the capability of the land for its varied uses—whether for specific cultivated crops, pastures, livestock, forests, wildlife, recreation or for multiple uses.

The type of land management modifies not only the soil fertility but also the water retaining quality of the soil. These conditions in turn determine or affect the type, quality and quantity of vegetative cover. The plant associations delimit the kind and population of wildlife. Soil conservation measures that build soil fertility enrich the variety and the food value of plant life. Improvement in the plant community is soon reflected in more wildlife species, higher population density, and greater size and vigor in individual animals.

Hand in Hand

That wildlife and soil conservation go hand in hand may be shown from an extremely significant report in 1951 to the people of Wisconsin on cover and watershed problems *(7)*. A study of 535 original large springs in a section of this relatively humid and generally flat state revealed that during the past century 18 per cent had completely dried up, 21 per cent had noticeably decreased their flow, while 61 per cent appeared about normal, even though reliable quantitative flowage figures were unobtainable.

The survey further showed that of their 10 million acres in cropland, 2 per cent was so severely eroded that further agricultural use was impossible; 5 per cent had lost 9 to 12 inches or virtually all of its topsoil; 25 per cent had lost 5 to 8 inches of its most fertile soil; 31 per cent had lost from 1 to 4 inches; and only 37 per cent of the farm lands were still without erosion problems. Loss of water and fertile soil was as damaging to wildlife population as it was to agriculture.

Most erosion control measures improve wildlife habitat. Contour farming, contour strip-cropping, terracing, developing grass waterways, crop rotation, planted field and wood borders, woodlot improvement, hedges, windbreaks, ditchbank and pond-border plantings and living fences all increase the mixture of vegetative types.

It is axiomatic in wildlife management that the variety and number of animals are greatest on "edges" where two or more kinds or associations of plant growth adjoin. These conditions are especially helpful in bobwhite quail and pheasant management. Agricultural practices that favor woody vegetation in field margins and fence rows or along water courses generally favor quail production. To vegetate eroded gullies, steep slopes, bald spots, rocky areas and other non-agricultural farm land, not only improves soil fertility but it increases soil moisture and generally improves greatly the habitat for quail and many other wildlife species. In the aggregate there are many millions of acres in American farms that can best serve wildlife.

Two Million Ponds and Water Areas

As evidence of further improved land use, the Soil Conservation Service, private soil conservation organizations and other organized groups and private individuals, have stimulated the construction of about two million ponds during the past two decades or a little more *(4)*.

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These ponds vary in size from a fraction of one acre to many acres in water surface. Most of them are of inestimable benefit to wildlife. They supply permanent water in many areas where previously there was a deficiency.

These farm ponds benefit upland game, non-game and waterfowl as well as sport fisheries. Under skilled management with wise stocking and fertilizing, many of the ponds have produced a sustained annual yield of from 100 to 250 pounds of fish per acre. In the northern prairie states many of these man-made ponds serve as breeding grounds for waterfowl and many others farther south attract migrant or wintering birds.

The conversion of some rice paddies on a rotation basis for waterfowl or fish production has been unusually successful. In some cases farmers and wildlife managers are creating new water areas specifically for wildlife. In many states water is being impounded to create small marshes or shallow wetland areas. An examination of 235 such man-made marshes in New York State in the summer of 1954 revealed that 85 per cent had one or more pairs of wild ducks nesting on them *(4)*. Many such areas in states to the south are of great value for wintering waterfowl.

As of 1953 Oklahoma had some 95,000 farm ponds varying in size from ½ to 10 acres[a]. Some of these are of great wildlife benefit while others seem to have low value. Adjacent land-use practices greatly alter water quality and the value these ponds have for wildlife.

Barstow *(3)* studied 21 clear and 24 turbid ponds in two counties of north central Oklahoma for vegetative production and waterfowl use. He found that the clear ponds not only produced the vegetation but received approximately 96 per cent of the waterfowl use. Barstow concluded that "creating and maintaining clear and productive farm ponds seems to be the most feasible and economical waterfowl management practice in this area."

In upland game management, particularly in the arid southwest and central portion of the country, water is the critical and limiting factor in wildlife populations. Quail have been known to double, triple and more than quadruple the numbers in dry sections of the country after water was provided. Relatively few bobwhite are found more than one-half mile from water. In desert and semi-desert sections most wildlife management is centered around the water supply where the wildlife concentrate.

Springs in arid areas are normally very small; hence their scanty water supply must be carefully husbanded. Fencing springs and seeps and constructing a trough or catchment basin to collect the water for livestock is desirable to prevent the spring from being trampled, silted and polluted.

[a]*Letter of SCS biologist, H. R. Wells, August 22, 1957.*

Irrigation

The development of irrigation in the more arid parts of our country has greatly benefited wildlife and increased its distribution and abundance because it has provided the essentials of water, food and cover.

Irrigation in many western and southwestern areas has converted almost completely barren areas into favorable and attractive habitat for quail, pheasants, doves, rabbits, ducks and song birds. Excellent fishing and upland game hunting have been provided in many places where they were almost non-existent formerly. Ditches and canals furnish water during the summer season when it is most needed; and the banks, which normally develop good vegetative cover, furnish good and attractive habitat as well as travel lanes to other food, cover and water *(6)*.

Some Practices

Unfortunately some agricultural management practices such as over-grazing, uncontrolled burning, drainage, or the widespread application of herbicidal and insecticidal sprays at times destroy habitat and wildlife, directly or indirectly.

The fencing of canals, major ditches, and farm ponds is usually an advisable agricultural operation, and at the same time it is an effective means of protecting nesting birds and animals from injury by livestock. It would aid still more if these fences were planted with desirable shrubs so that live fences would develop. These add to the food supply, especially in winter, and provide an attractive environment for many wildlife species; yet still more important, they afford essential escape cover from predators.

All of these soil and water conservation practices render great benefit to wildlife. The problem in Oklahoma and elsewhere is to make greater use of them. It would mean much to the state economically, socially and esthetically if it were more generally realized that valuable crops of fish and wildlife can be produced by deliberate effort. The same laws of cause and effect operate in this field as in all other fields of science.

OKLAHOMA'S WATER AND WILDLIFE RESOURCES

It is apparent that in most of Oklahoma, and particularly in the central and western parts, water in satisfactory distribution is in short supply. It would seem wise to make the maximum use of every drop of water available for the benefit of agriculture, wildlife, industry and for the total state and national economy. I have no doubt that under present conditions some big dams are necessary, but in order to obtain maximum use and distribution of water it is most important that sound soil conservation practices be employed and that many more small dams and ponds be constructed. The best use of

Farm ponds benefit upland game, non-game animals and waterfowl, as well as sport fisheries.

Stabilization of stream banks reduces silt runoff, improves fishing and enhances the beauty of the stream and furnishes cover for wildlife.

your water, I believe, is to use it wisely where the rain drops fall. As Person *(5)* has expressed, "The most instantaneous and effective of all fresh-water reservoirs is the soil." Erosion and loss of water are both an individual and public problem and responsibility. Destructive effects of loss of water and soil are social as well as economic.

Aridity of the land increases with erosion and land abuse. This, of course, affects wildlife adversely. Oklahoma needs more wetlands. The recent wetland inventory *(2)* made by the U. S. Fish and Wildlife Service with state cooperation, shows that Oklahoma's wetlands occupy a relatively small area—only about 310,780 acres.[b] High value waterfowl wetlands comprise 7 per cent of the acres, those of moderate value 48 per cent, and lands of low value 45 per cent. The report further shows that private enterprises, including Oklahoma land owners and sportsmen's groups, have done little to improve wetlands for wildlife. Most wetland development for wildlife in Oklahoma has been accomplished by the state Game and Fish department and by the U. S. Fish and Wildlife Service.

Wells[c], biologist of the Soil Conservation Service, reports that in 1953, Oklahoma's wetlands included 15 federally-built lakes totaling 161,000 acres and 714 non-federal lakes each with an acreage of more than 10 acres but aggregating 189,725 acres. Through effective efforts of the Soil Conservation Service, some 137,000 acres of private lands have been improved for wildlife and most of this in connection with water development. Some 4,000 acres are intensively developed annually in cooperation with the state Fish and Game department. Since 1953, farm ponds, flood control and flood prevention structures have been constructed at an accelerated pace.

Graham[d] of the U. S. Soil Conservation Service has summarized the extent of conservation practiced now on land in Oklahoma as follows (figures are given in acres and to nearest 1,000):

Contour farming 2,500,000; crop residue utilization 2,150,000; pasture planting 1,500,000; tree planting 20,000; drainage 160,000; improved water application 151,000; terracing 95,000; fish pond improvement 13,500; pond construction 85,000; wildlife area improvement 125,000.

The value of these practices for wildlife depends upon local conditions and the extent and way each practice is applied. Drainage can be and often is a benefit to wildlife as well as to agriculture, yet it can be and too frequently is highly inimical to wildlife and the overall public interest.

River Reservoirs

Oklahoma has many large river impoundments, and many more are planned. These should be developed and managed to serve the broadest public interest. Advanced planning is essential. The National Coordination Act (Public Law 732, 80th Congress) needs amending to insure that wildlife resources be given their just consideration. For the greatest good of the people of the state and of the nation, engineering and biological planning should proceed concurrently and cooperatively. Water resources fall far short of their potential value unless perimeter lands within each large reservoir project area are managed in the broadest public interest.

The recent Congressional report *(1)* on *Army-Interior Reservoir Land Acquisition Policy*, shows that such man-

[b] *279,700 acres were inventoried, and it was believed that this represented 90 per cent of the state's acreage, hence the total is assumed to be about 310,780 acres.*

[c] *Letter, August 22, 1957.*

[d] *Letter, August 19, 1957.*

In brush lands now being cleared some strips should be saved. Windbreaks are a blessing to human beings, to their stock and crops and to wildlife.

On a severely grazed range, the cover departs, the soil departs, the wildlife departs and human beings arrive at a precarious position.

agement is not being accomplished under present Army Engineer and Interior policies, and it shows that wildlife, including fisheries, should be given much greater consideration in these reservoir developments. The report concludes that "the flowage easements obtained by the Corps of Engineers are inadequately drafted and do not properly protect the government's interest" nor the public interest. Too frequently discriminatory private benefits have accrued at public expense. Access roads to the perimeter of reservoir areas should be provided in order that the public can obtain the benefits of fishing, hunting, boating, and other recreation or study. Too frequently access has been denied.

Development plans for each reservoir lake must be adapted to local needs which often can favor wildlife and fisheries. Planting of food and cover species often is desirable and at times share cropping of agricultural foods can greatly favor farmers as well as game and other wildlife. Subimpoundments and de-watering systems to favor fish or wildlife can be built economically if properly coordinated planning has preceded the establishment of the lake. Much often can be done to prevent turbidity and thus greatly improve conditions for fisheries and wildlife. Good development must provide for cooperative but coordinated participation by the state Fish and Game department, private agencies or groups, as well as U. S. Engineers and the federal Wildlife Service.

INIMICAL WILDLIFE PRACTICES

While much conservation progress has been made, there are sections of the country where unresolved and conflicting problems still exist. Some of these problems are biological, some administrative, and some are the result of conflicts of interest which at times become clouded with personality disputes. A number of these conflicts have existed for years. They show the necessity of conflicting groups such as agricultural, engineering, wildlife, or public and private interests getting together early in an objective and constructive attempt to resolve differences in the public interest.

The problem of pollution is far from resolved. Pollution may occur in the form of industrial or domestic waste, or it may be in the form of eroded soil that silts fish streams, fish-spawning beds, duck lakes, marshes and recreational areas.

Likewise **the menace of over-grazing** on both public and private lands has both social and economic effects on individuals, communities, and the state. Over-grazing adversely affects wildlife and the water supply.

Extensive brush clearing that is sponsored or subsidized by the federal government is currently an important controversial local issue in parts of Texas and perhaps elsewhere. Ranchers who have demanded that strips of brush and trees be left in very large clearings have been denied assistance unless there has been practically complete clearance. Such strips reduce wind erosion, lessen soil moisture loss, and provide cover and essential habitat for deer, turkey, quail, peccary and other wildlife. When federal assistance is granted it should, in my opinion, include any reasonable conservation measures that give consideration to ecological consequences.

A more serious controversy deals with **the drainage issue**, and particularly as it relates to the important duck-nesting pothole region of the Dakotas and southwestern Minnesota. In this section from 1943 to 1954, federal subsidies and other federal aid and encouragement have been largely responsible for the drainage of 350,000 small water areas totaling approximately one million

Once an active gully, now a wildlife haven.

Rosa multiflora and grass strips on the contour furnish cover and some food to wildlife the year around.

acres. It is estimated that an additional 1.5 million acres in this same section of the country will be drained unless there is a change of national policy. It seems to me that this prime waterfowl-habitat section is being needlessly destroyed.

Paradoxical Drainage

To me it doesn't make sense for our government, which by law and treaties is pledged to protect and support migratory wildlife, to permit one of its departments to encourage and subsidize drainage of prime waterfowl nesting areas that needlessly increases the production of agricultural surpluses, while at the same time that same arm of government initiates a costly soil bank program that takes agricultural land out of production to decrease farm surpluses. Also at the same time that this paradoxical federal drainage is supported, another branch of our same government is spending much needed federal funds to buy wildlife refuges and management areas in order that it can build and maintain wetlands and perpetuate our great waterfowl resources.

Progress Has Been Made

Despite these conflicts, much progress has been made, and the Soil Conservation Service and local conservation groups deserve great credit for helping to improve wildlife habitat throughout the country by means of sound soil and water conservation practice. Sound wildlife, soil and water conservation programs are inseparable.

REFERENCES CITED

1/Anon. 1957. *Army-Interior Reservoir Land Aquisition Policy. Congressional Report, Union Calendar No. 465.* House Report No. 1185 of the Comm. of Gov't. Operations, 85 Congr., 1st Session. Washington, D. C.

2/Anon. 1955. *Wetland Inventory, Oklahoma.* U. S. Fish and Wildl. Serv., Reg. Office, Albuquerque, N. M. (Processed.)

3/Barstow, Calvin J. 1957. *Waterfowl Use of Clear and Turbid Farm Ponds in North Central Oklahoma.* (Ms.) Okla. A. & M., Stillwater, Oklahoma.

4/Graham, E. H. 1956. *Nature Protection as a Part of Land Development.* Proc. of Internat. Union of Conserv. 6th Tech. Session, Edinburgh, Scotland.

5/Person, H. S. 1935 (Revised 1936). *Little Waters, A Study of Headwater Streams and Other Little Waters, Their Use and Relation to the Land.* Gov't. Printing Office, Washington, D. C.

6/Pratt, H. P. and W. S. Lang. 1942. *Wildlife Management on Irrigated Farms.* Soil Conservation 7:(10) 257-258. S.C.S., Wash., D. C.

7/Scott, Walter B. 1951. *Report to the People of Wisconsin on Cover Destruction, Habitat Improvement and Watershed Problems of the State in 1950.* Wis. Conserv. Bull. 16:(2). State Conserv. Dept., Madison, Wis.

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What Women and Children Can Do to Promote Soil Conservation

MARY KENNINGTON

The author in trying to be specific about what women and children can do to promote conservation found it necessary to state a basic philosophy of soil conservation work. She interpreted it to mean, treating the land in such a way that it will be made secure for high productivity.

LAND, WATER, AND PEOPLE have a close relationship to each other. Land and water are inseparable in agriculture, and as people wisely use their land and water resources, they are properly nourished and reimbursed for their efforts.

Our Responsibility and Trust

Our land belongs to *all* people, but each person must know and understand more fully the problems of production adjustment and the meaning of conservation if he is to have the necessary knowledge and understanding to make wise decisions about its use. We may start by helping people through improving skills, but we should help them to make progress in using research and judgment to solve their other problems. While we help men and women now managing farms and homes to apply research to their problems, we must also help the children with training in subject-matter material and develop leadership.

The home is a fundamental unit of civilization because the family is the first training group of the human race. Always I have heard the remark that if you educate a man, you educate an individual; if you educate a woman, you educate a family. Since the family is the first training unit of an individual, perhaps we should give greater emphasis on the conservation of our resources to the women of our homes so that their influence can be used early in the child's formative years. Those of us who have intimate contact with families and homes of a community can guide each member to a richer life through a family approach to agricultural or production problems. We have a part in developing the human and natural resources of people, and that is an important responsibility

and trust. Agriculture and care of the land are important because:

Farmers are custodians of the soil
Soil produces the basic necessities of life
Farmers are the keepers of attitudes, ideals and traditions.

We who work directly with families must follow their activities closely enough to know their interests and abilities. If real progress is to be made we must lead families into endeavors they may not immediately understand. We must inspire them to try new fields because effective programs must be based on local needs and *en-*

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lightened desires. I stress enlightened desires because I do not believe we can offer only what people ask for. How can they ask for something about which they do not know? This was expressed quite well by one simple but prudent individual who said, "You can't no more do what you don't know how to do than you can come back from where you ain't been."

We who are concerned with the development of people must not be content with seeing people *accept* change—it must be directed. Merely accepting change implies submission, while directing it implies vision, planning, and the will to action.

Today's farmers have very different and much more complicated problems than did their fathers and grandfathers. They also have many scientific advantages hardly dreamed of 50 years ago. To solve these problems and use the mechanical, chemical, and electrical know-how, the family needs many different kinds of help. As an example, consider the Soil Bank Program.

Here is a new program, and its implementation brings about questions of management that affect the entire family, such as, "To what extent shall we participate? How will this affect our income? What changes will we need to make in our operations?" Each family must be helped in terms of a "family" situation, and the help must be given in such a way that facts are clearly related to the problem so that the family will have a basis for making decisions. The members of the family must begin with an honest inventory of what they have and follow this by a decision as to what they want and can obtain. Then, and only then, can they begin to bridge the gap from where they are to where they want to go.

A successful and realistic farm approach must be planned on the basis of a farmer-and-wife team with each partner fully aware of what needs to be done and why. Good management planning is the key to success.

Women know that the money needed to buy automobiles, television sets and deep freezers comes directly or indirectly from the land.

Perhaps with understanding by all parties as to the goals to be attained, the wife would willingly forego or curb some expenditures in order to use funds for the purchase of equipment or fertilizer to build for future income. On the other hand, perhaps adequate equipment for the home, such as a refrigerator or washing machine, may be the means of saving sufficient food or time to permit other activities on the wife's part that will buy the needed farm equipment.

Together with the families, we must work out plans for land use, including crops and livestock production, income and expenses, food production and consumption, and other farm data pertinent to the family's living.

Women's View of the Future

Land is among our most precious resources. Its proper use will enable us as individuals and as a Nation to live happily and stay strong. If we despoil it, we shall have misery and loss of strength.

Perhaps women ask, and men wonder, why the women are trying to do conservation work. Why not? Certainly women have an interest in the welfare and future of their country and their children. They represent a tremendous army of ideas, interests, and abilities which should be used to assure us and future generations a richly productive and beautiful countryside, prosperous towns, food in plenty, farm-grown materials for our industries, and security for the future.

The theme of home demonstration groups, "Today's Home Builds Tomorrow's World," indicates a strong tie with soil and water conservation, because "Today's Home Builds" *on the land* and *from the land*.

A 1949 report on farm land ownership in the United States shows that women own approximately 11 per cent of the land, and women, more frequently than men, plan for the descent of their holdings. Women are concerned about the future security and welfare of children and realize that this security is based on the wise use of our resources. Home demonstration club programs are based on the wishes of the participating group. It is obvious that, from the requests agents receive, women should be given assistance so they can do something about protecting their security. The demands for more conservation help have steadily increased through the years. Women will continue to be a part of the conservation team (1) if they understand how they can help, (2) if they know where to get information, and (3) if they are given the opportunity to learn *how* to do and *what* needs to be done.

We can help women through their club programs to see the advantages of proper land use so that they can—

A/Teach children that foods come from the soil and make sure they learn conservation of soil, water, forests, grasslands, and wildlife

B/Plan tours for their home demonstration clubs, parent-teacher associations, garden clubs, art groups, church groups, and many others, so that they see real soil and water conservation on the land

C/Assist teachers in the schools to carry out projects in tree planting, lawn sodding, beautification of grounds, and related activities

D/Use simple conservation practices for their gardens and homesites

E/Plan a neighborhood project by taking an unsightly area in the community and developing it, through planning, planting, and work, into a beauty spot.

Today's Foundation for Tomorrow

The conservation of America's natural resources has long been a vital part of the Scouting program. One good turn deserves another, so why not give an extra boost to the Boy Scout Conservation Good Turn projects which have been continued.

None of us needs to be briefed on the Izaak Walton League and what it stands for in terms of conservation of natural resources, but perhaps one should pause to consider its great contribution in the development of today's youth so that they will be able, intelligent leaders of tomorrow.

The report of the 1956 *Conservation Conferences of Young Outdoor Americans* sponsored by the Izaak Walton League had as its theme, "Soil: Condition, Problems, and Needs." This was studied in four discussion groups: (1) Soil for Fiber and Food, (2) Land for Recreation, (3) Land for Living, and (4) Soils for the Future. This sounds like a technical adult program, doesn't it? Think of the impact these young people can have as they return to the groups they represent and pass along information to fellow club members in a language they understand.

Additional activity in conservation should be stimulated with local youth groups. State and district extension service staffs appear to recognize the long-time values of such projects, but demands on the time of local agents often prevent adequate preparation; hence the promotion is not as strong as it might be. In 1955 all extension agents devoted 35 per cent of their time to 4-H Club or YMW groups. Perhaps conservation personnel and state associations [including SCSA chapters] could be helpful to local agents by assisting with tour arrangements, teaching conservation practices at regular meetings, providing awards and developing exhibits and visual aids.

Conservation work is essentially a responsibility of all of us, but you who are most interested in reaching the youth groups could be helpful to local leaders in promoting participation by making available simple, readable material that appeals to the different age groups. The illustrated colored booklets in cartoon-style, which the Soil Conservation Society of America published are excellent examples of material that have universal appeal. [**The Story of the Land** and **The Wonder of Water.**]

4-H Clubs and other youth organizations offer an excellent opportunity for us to lay the foundation for future protection. With experience in learning to plan and apply conservation practices of proper land use and treatment, children learn their responsibilities, both to themselves and their community.

Guidelines for projects for youth groups should—

Show vividly that something is happening—that there are land problems

Convince members that something can be done in a practical way—that there are solutions

Give opportunity to learn skills about soil conservation work through participation in field work or demonstrations—learn to do by doing

Enable youth to become familiar with community organization and leadership—to be personally a part of the community social and civic pattern.

There is a direct relationship between soil and the people. Some idle acres impose burdens on communities. Why not help women and children to protect, conserve and use these idle acres?

The basic problems of depletion, erosion, overuse, and exploitation are the same in all states. Women's clubs and youth groups can help protect and rebuild idle acres. They can become conscious for example, of the cost of forest fires and be directed in protecting our forests.

The 1955 report of Extension Activities and Accomplishments, shows an enrollment of 1,442,966 women in organized home economics groups. There were 2,155,952 boys and girls (ages 10 to 21) enrolled in 4-H Clubs and 288,763 young men and women (ages 18 to 30) in activities for young men and women. Any assistance given to these groups alone would be tremendous in promoting a conservation program.

Only a small portion of these members received direct training and experience in soil and water conservation activities. The numbers could be increased greatly if proper motivation aids and training could be provided for agents and local leaders. The support of these groups would no doubt strengthen and encourage the work of other organizations, such as garden clubs, Federated Women's clubs, Scouts, Campfire Girls, and many others.

Lack of knowledge, indifference and carelessness are obstacles in the way of a successful conservation program. It is our privilege and responsibility to erase these obstacles by bringing into our program *all* those who are to benefit from it. Women and children *do* benefit. Let's dispel this lack of knowledge and indifference and bring women and children into active roles in conservation programs.

Field Notes

Use Stubble Instead of Burning It

M. A. PHIFER

VALUABLE ORGANIC MATTER, so necessary in maintaining moisture for plant growth, can be destroyed by burning. In recent years, along with the marked increase in acreage planted to soybeans following small grain, there has been much burning of grain stubble.

The burning of straw following small grain harvest has been a common practice in the South Carolina coastal plain area for many years. Some farmers, however, have tried to plant in the stubble without burning, but resulting stands were always uncertain. Thus burning was encouraged.

Realizing that burning is not good conservation farming, a concerted effort was begun in 1954 by technicians and farmers to tackle the problem. In Calhoun County, South Carolina, field trials on soil conservation district cooperator farms were established. These consisted of various methods of land preparation and planting, without burning straw, utilizing existing farm equipment.

Due to a very dry season none of the methods tried was conclusive. It became evident that moisture was a limiting factor in obtaining a stand. Accordingly in 1955 for comparison with methods previously tried, several plots were planted directly in the stubble without land preparation or burning. Three farmers, Jim F. Hiers of Ehrhardt, Heyward Shuler and Clyde Stroman of Orangeburg, planted many acres by this method.

The results were very encouraging: a saving of time at a very busy season; a saving of the cost of land preparation; and improved moisture conditions. There was evidence, too, that the method was effective for control of wind and water erosion. These field trials were initiated and directed by J. T. McAllister, S.C.S. Conservation Equipment Engineer, who is continuing the work in South Carolina and Georgia.

Tours to the Hiers' farm were arranged by the supervisors of the Edisto Soil Conservation District who realized early the importance of this method.

Interest soon became widespread among farmers from surrounding districts. In 1956, 65 farmers planted 7,500 acres of soybeans in grain stubble without burning as a prior land preparation. The practice has spread throughout the grain-soybean growing areas of the Carolinas and Georgia. Reports show an increase in 1957 to approximately 30,000 acres.

In order to plant in undisturbed soil covered with grain stubble, it is necessary to have planting equipment that will open a furrow 10 to 12 inches wide and 4 to 5 inches deep. In this process all the straw and stubble

. . . A furrow 10 to 12 inches wide and 4 to 5 inches deep, with the straw and stubble covered in the row middle. Soil Conservation District supervisors arranged tours to observe methods.

M. A. Phifer, Jr., is work unit conservationist with the Soil Conservation Service in Bamberg, South Carolina.

is completely covered in the row middle. It was found that lister-type planters equipped with middle buster bottoms or rotary disk moldboards would do a satisfactory job.

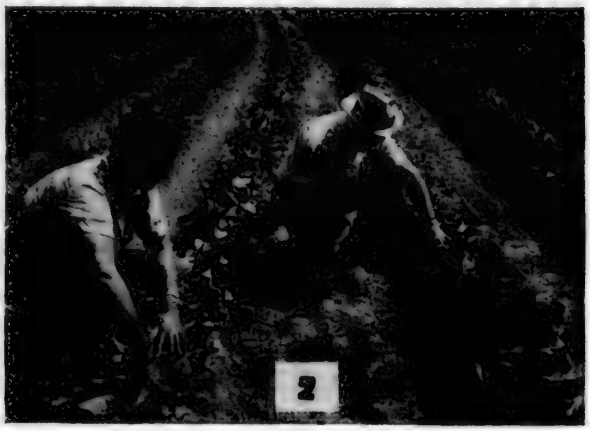
Prior to planting it is necessary that the straw be uniformly spread behind the combine. In cases where large quantities of straw were left, a chopper attachment to the combine, or the use of a rotary mower, was found beneficial in conditioning the residue.

Millet and grain sorghum also have been planted in grain stubble. Several farmers planted corn in green lupine and rye cover crops by this method. All plantings have been made in standard row widths of 36 to 42 inches. Difficulties in cultivation developed when conventional methods were used. It was found that by using disk hillers, followed by small sweeps and working next to the row, a satisfactory job of cultivating could be done. In this way the row middle, where the straw and stubble had been covered, was left undisturbed until the last cultivation.

An approach to solving the problem of planting in undisturbed crop residues has been tried through the development, adaptation and adjustment of farm equipment. No attempt has been made to evaluate agronomic phases, though important observations have been made. Farm equipment dealers are cooperating in the work as a phase of the national "Dealer-District" program. As the work develops, it is evident that mulch planting is destined to become a very important phase of soil and water conservation.

Mulch-planted soybeans are cultivated with disk hillers and sweeps next to the row. Middles are not disturbed until last cultivation.

Work Unit Conservationist Phifer and T. C. Mauer, Southeastern Agronomist, (SCS), examine mulch-planted soybeans after second cultivation. Note absence of weeds and grass.



Three generations study stubble-mulch farming; soybeans followed small grain. Father, son, and grandsons on the John Hiers' farm in the Bamberg (South Carolina) Soil Conservation District.

James Hiers, Jr. of Ehrhardt, South Carolina, harvests mulch-planted soybeans yielding 32 bushels per acre.

Substantial Residual Effects of Nitrogen Observed on Summer Fallow Wheatlands in Oregon

ALBERT S. HUNTER, W. E. HALL, AND CLEVELAND J. GERARD

To make the land as productive as possible is one of the principal objectives of any sound program of soil conservation. Improvement of soil fertility levels is one of the most important means of increasing productivity. It has been demonstrated on many farms in the summer-fallow wheat area of the Columbia Basin counties of Oregon that the yield of wheat may be increased by applications of nitrogen. In recent years the use of nitrogen fertilizer in that area has grown tremendously and is now fairly general. Further studies are planned; the results reported are progressive.

MOST FARMERS customarily charge the whole cost of nitrogen fertilizer against the crop to which it is applied and give little consideration to its residual effects on later crops. Some data obtained in Oregon in 1956 show that the residual effects of nitrogen may be of considerable importance from the standpoint of increased yields and the economics of fertilizer usage.

In the fall of 1953 an extensive program of research was initiated on the soil fertility problems of wheat production in the dryland summer fallow area of the Columbia Basin counties of central northern Oregon. Field-plot experiments on winter wheat were completed in 1954 on 40 farms in the lower rainfall area. Rates of 0, 20, 40, 60 and 80 pounds of nitrogen per acre were applied to some plots in the fall at seeding time and to other plots in the spring as the growing season opened. Each application rate was repeated on four plots in fall and spring. All nitrogen was from ammonium nitrate.

The wheat of the 1954 crop was harvested in July and August. The land was then left in stubble until the spring of 1955, when it was plowed or otherwise prepared for summer fallow. Wheat for the 1956 crop was seeded back on the experiment sites in the fall of 1955. In two cases nitrogen fertilizer was applied uniformly over the site of the 1953-4 fertilizer experiment, but in no case were the plots fertilized differentially for the 1956 crop.

In the spring of 1956 the sites of 25 of the 40 experiments of 1953-4 were re-visited and examined for evidences of residual effects of nitrogen. A few sites were omitted from examination because they had exhibited considerable variability in 1953-4. It was not feasible to go to all the 40 sites, which were scattered throughout an area of over 2000 square miles of wheatlands.

A. S. Hunter is presently Professor of Soil Technology, Agronomy Department, the Pennsylvania State University, University Park, Pa., and C. J. Gerard is now Associate Soil Physicist, Texas Agr. Experiment Substation No. 15, Weslaco, Texas. When this article was prepared they were located in Oregon. W. E. Hall is Superintendent of the Sherman Branch Experiment Station, Moro, Oregon. *Technical Paper No. 1021, Oregon Agricultural Experiment Station, Corvallis.*

In comparison with the growth on the check plots (no nitrogen), increased growth of wheat resulting from residual effects of the nitrogen applied two years earlier was visually apparent in the spring of 1956 on 17 of the 25 experiment sites of 1953-54 that were examined. Lack of time prevented obtaining yield data on all 17 of the farms. On 10 farms the fertilizer plots of 1953-4 were relocated and harvested for yield determination.

The table summarizes by counties the yields obtained in 1954 and those obtained in 1956 from reharvest of the same plots, differentially fertilized only for the 1954 crop. The yields are given in bushels per acre.

Nitrogen, applied,	Umatilla Co. 2 farms		Morrow Co. 3 farms		Sherman Co. 4 farms		Wasco Co. 1 farm		Mean, 10 farms	
Lbs./A	1954	1956	1954	1956	1954	1956	1954	1956	1954	1956
0	11.0	23.2	28.5	33.0	29.5	30.3	28.7	34.4	25.4	30.1
20	10.0	24.6	30.4	36.6	38.1	28.7	44.1	33.9	30.8	30.8
40	12.4	26.2	29.3	41.0	43.6	29.0	52.3	36.4	34.0	32.8
60	10.6	28.3	28.0	39.5	45.5	29.8	56.1	33.3	34.3	32.7
80	11.9	30.8	25.6	44.6	48.3	30.6	52.4	36.6	34.4	35.4
	Nitrogen Applied in Spring of 1954									
0	11.0	23.2	28.5	33.0	29.5	30.3	28.7	34.4	25.4	30.1
20	11.0	28.1	32.5	36.1	34.8	30.8	39.3	37.2	29.7	32.4
40	10.1	30.1	33.0	41.3	36.4	33.7	46.2	37.3	31.1	35.6
60	11.0	33.8	32.5	43.6	39.8	36.4	49.1	36.2	32.8	38.0
80	11.0	36.7	32.7	44.7	41.4	39.0	52.9	38.6	33.9	40.2
	Means for Fall and Spring Applied Nitrogen, All Rates									
Fall 1953	11.0	26.6	28.4	38.9	41.0	29.7	46.7	34.6	31.8	32.4
Spring 1954	10.6	30.3	31.8	39.7	36.4	34.0	43.2	36.7	30.5	35.3

It is evident from these data that some rather substantial wheat yield increases were obtained in 1956 from residual nitrogen applied to the 1954 crop. The largest were obtained in Morrow County, where the increases ranged from about 3.5 bushels from the nitrogen residual from 20 pounds applied to the previous crop to about 11.5 bushels produced by the residual nitrogen from 80 pounds. Substantial yield increases also resulted in Umatilla County. It is to be noted that in the experiments in these counties, owing to soil moisture deficiencies, unsatisfactory yield responses were obtained in 1954 from the nitrogen applied.

In Sherman and Wasco Counties very good yield responses were obtained from nitrogen applied in the fall of 1953. The residual effects of this fall-applied nitrogen

were almost negligible in 1956. Spring-applied nitrogen produced lower yield increases than fall-applied nitrogen in 1954 but the residual effects of the nitrogen applied in the spring were greater in 1956 than those applied in the fall.

Comparison of the 1954 and 1956 yield data indicates that the yield increases obtained in 1956 tended to be inversely related to those of 1954; that is, where the effects of nitrogen were larger in 1954 the residual effects were smaller in 1956, and vice versa. This seems to indicate that in this summer fallow area if nitrogen fertilizer is not utilized by the crop to which it is applied, a large portion of it will remain in the soil, available to the crop grown two years later, but, on the other hand, if substantial yield increases are produced by nitrogen on the crop to which it is applied, its residual effects will be small.

In general, the residual effects of nitrogen applied in the spring of 1954 were considerably greater than those of nitrogen applied in the spring of 1953. Considering the means for the 10 farms, the nitrogen residual from 80 pounds applied in the fall increased the yields of wheat by 5.3 bushels, while that from the same amount applied in the spring increased the yield by 10.1 bushels per acre.

Some of the differences in residual effects of fall and spring-applied nitrogen may undoubtedly be attributed to differences in the amounts of precipitation and possible leaching to which the nitrogen was subjected after application. The fall-applied nitrogen was subjected to the leaching effects of the precipitation of three winters, as opposed to only two winters for that applied in the spring. The data from eight Weather Bureau stations distributed about the area show that for the period from the application of fertilizers in the fall of 1953 to harvest in 1956 the average precipitation was about 36 inches, approximately 2 inches above normal for the period. From the application of nitrogen in the spring of 1954 to the 1956 harvest the average precipitation was about 29 inches, or 7 inches less than that on the nitrogen applied in the fall. The crop-season rainfall averaged about 9 inches during the fallow year, 1954-55. This was about 3 inches below normal. Rainfall during the 1955-56 crop season was about 16 inches, 4 inches above normal.

It is evident from the data presented that on at least some wheat farms in Oregon the residual effects must be considered in the evaluation of the effects of nitrogen fertilizers. With wheat valued at $2 a bushel and nitrogen at 15c a pound, on several farms the yield increases resulting from residual nitrogen were large enough to cover the whole cost of the nitrogen applied two years earlier, especially in the case of applications made in the spring.

Further studies of the residual effects of nitrogen on wheat in Oregon are planned.

Mr. Kawabata's Planting Brick

CHARLES R. HURSH

EROSION CONTROL TECHNICIANS are often obliged to devise a new technique for a particularly difficult problem at hand. Such a technique has recently won for its originator, Mr. Yūsaku Kawabata, an Outstanding Service Citation and an award of 20,000 yen from the Ministry of Agriculture and Foresty of Japan. Mr. Kawabata combined a number of good ideas, such as the seed pellet and the continuous sod strip, into a technique that has interesting possibilities for other parts of the world.

In Japan, bare surface conditions result from frequent landslides and earthquakes, particularly common in the tertiary formations of southwestern Honshu. Here it is important to re-establish a vegetation cover as quickly as possible, and technicians have a problem of vegetating this loose soil material on very steep slopes under torrential rainfall. Mr. Kawabata's planting brick has proved to be the most successful planting aid that has been tried so far.

The planting brick measures 26 x 20 x 3 cm. or about 10 x 8 x 1¼ inches. It is made from enriched soil and chopped straw and pressed into a light block, with depressions on the top surface for the seed. Seed then is brushed into these depressions and is held in place with a protecting coat of clay mud. The bricks can be made up in quantity in advance and stored until needed, or they can be manufactured directly in the field. As much or as little organic material may be incorporated as desired, and the fertilizer added can be modified according to the needs of the site. The first steps in making the planting bricks are similar to those in making the mud plaster commonly used for walls of the houses in Japan. Water is added gradually to soil and straw on a mixing board and the material worked to a consistency that will hold together well. However, for planting bricks much less water is used than for plaster. The only general requirement for bricks is that the mixture will hold together well after coming out of the press. The secret

Dr. Charles R. Hursh, formerly director of the Coweeta Hydrologic Station in North Carolina, was Fulbright Research Professor in the Department of Forestry at the University of Tokyo, when this note was submitted.

here is to have the ingredients well mixed and quite damp to begin with, and to press until some free water just begins to come from the mold. How to do this is soon learned by a little practice.

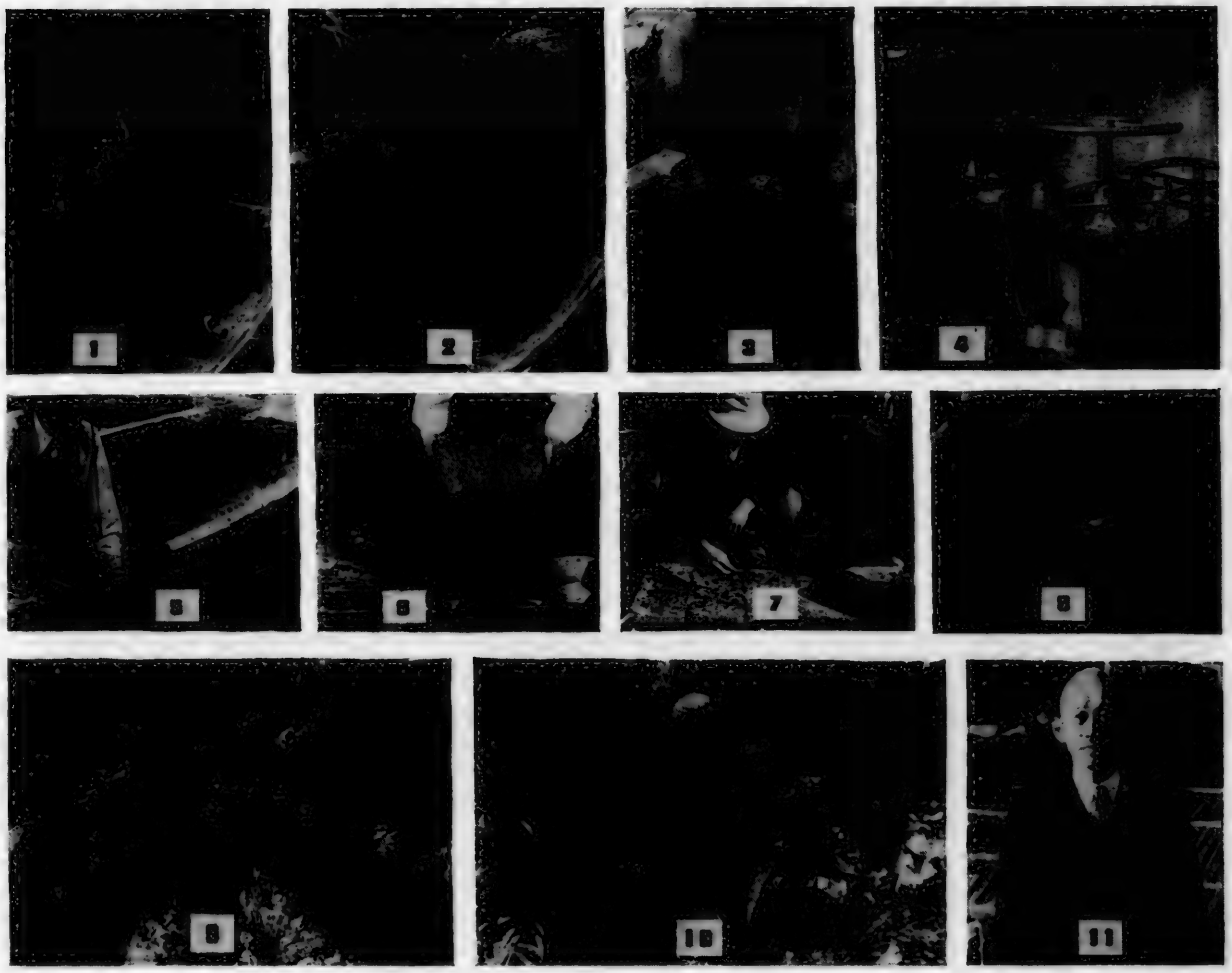
The best success has been obtained in Japan by setting the planting bricks very early in the year, so that the seeds will sprout at about their normal date. The rapid growth will then provide maximum protection by the typhoon season. However, the bricks have been set during all seasons of the year. In the fall, grasses that will grow in winter and winter grains are used.

Mr. Kawataba gives the following formula for making 1,000 vegetation blocks, but this can be modified to suit any particular situation:

Soil	2.3	cubic meters
Clay	15	kilograms
Manure	80	kilograms
Cut straw	20	kilograms
Ammonium sulphate (20%)	9	kilograms
Superphosphate (18%)	9	kilograms
Potassium chloride	4.5	kilograms
Seed	2	kilograms

Although the planting brick was designed for erosion control on bare steep sites, it has been used successfully also for protecting road and river banks, earth dams and reservoir shore lines. In addition it has been employed for range betterment and for growing barley and wheat on particularly poor sites.

1/To make bricks, layers of chopped straw and soil are spread on a platform. 2/Water is added and material mixed. 3/Basic mix is molded in a frame. 4/Patented "Ryocker" press has an upper plate for making depressions for seeds. 5/Bricks from the press—on the top surface there are 120 small ½ cm. depressions, and 5 cups 2 cm. in diameter and 1½ cm. deep. 6/A coating of thin clay mud holds the seeds. 7/Before clay is applied, seeds mixed with soil and wood ashes are sprinkled over the surface and brushed into the depressions. Large seeds, such as acorns, are placed directly into larger holes. 8/On planting site the bricks are pegged with a stick or cuttings. 9/Successful stand of grass obtained in one growing season on a difficult slope. 10/A good growth of cuttings and grass together. 11/Yusaka Kawabata, of the Erosion Control Section, Ministry of Forestry and Agriculture, Japan, is the originator of the brick.



Improvements in Using Power for Soil Sampling

FREDERICK E. COLLISON AND GENE H. NOVAK

Wet or dry heavy clay soils are a scourge to soil surveyors. These gumbos or adobes, as they are sometimes referred to by farmers, are not only tough to sample but to farm. Auger extractions and cleaning are difficult when the soils are wet and sticky. Under dry conditions, boring is laborious.

In the basin of California's San Joaquin Valley are large acreages of heavy clays. These soils are plagued by high water tables. Excess salts further complicate farming operations. Drainage can help in reclaiming and improving these soils in much of the Valley. For placement of workable surface and tile drains, detailed subsurface soil investigations are required. Power augers have been employed. New developments in subsurface investigations are described.

A power auger developed in Southern California has been described by Wohletz and Haughton.*

This auger, modified to make ten foot borings, was used successfully for several years in the San Joaquin Valley for drainage reconnaissance and deep-strata investigations. Two 3½ h.p. gas engine *Ground Hog Augers* used in rigorous field work became badly worn and showed that further improvement was necessary (Figure 1).

Carrying out suggestions made by Wohletz and Haughton has resulted in an entirely new power auger unit (Figures 2 and 3).

How It Operates

The new unit is mounted on a Willis 4-wheel drive pickup and is entirely contained within the limits of the pickup bed with tail gate extended. It meets California state highway regulations for height (extended or folded), overhang, width and weight limits.

Pressures up to 5,000 lbs. are delivered independently to two hydraulic motors which furnish the power for rotation and vertical travel. These pressures are supplied by a double action pump mounted under the pickup bed and driven by the pickup engine through the power-takeoff unit. No additional power source is needed. Through transmission gears and engine acceleration, a wide range of speeds and torque are possible (Figs. 4 & 5). [*Figures 4-11 are on page 80.*]

The rig is capable of smooth vertical positive travel and rotation either way. The universal joint, shown in Figure 6, permits movement of the auger up to five feet away from the boring site so that the auger can be cleaned without detachment or covering the hole. Rotation is utilized readily in cleaning sticky clays from a worm auger (Figure 7).

*Wohletz, Leonard R. and Fred A. Haughton, Jr. *"Pacific Coast Reports Progress in Using Power for Soil Sampling."* Journal of Soil and Water Conservation, Sept., 1953, pp. 236-39.

Frederick E. Collison is soil conservationist, and Gene H. Novak, soil scientist, SCS, Fresno, California.

Versatility

Although this power auger was primarily developed for drainage investigation and planning work, it has a wide range of adaptability. All three basic types of augers, *conveyor, orchard* and *tube,* are successfully used on it. Installing and pulling piezometer tubes and casings for observation wells is easily done, using the unit as a press and hoist as needed. Borings up to 20 feet have been made—to 10 feet without the necessity of making and breaking extensions (Figure 2).

The unit, during one demonstration, bored through weakly cemented hardpan of the Exeter soil series. In wet clays, up to five foot increments of soil were extracted on a six-inch diameter conveyor auger at one time, making full 10-foot borings possible by pulling the auger from the ground only twice. These performances exceed expectations.

The unit has been used only on a level valley floor, but can be used in hilly or mountainous terrain. Borings may be made at sites that are accessible to a 4-wheel drive pickup. It is not necessary to have the pickup in a level position.

Incorporates Safety Features

A number of design and operation features are incorporated that insure the safe use of this machine, protecting both the operator and equipment.

Saves Time and Expenses

Accurate cost studies on the new auger are not now available. Indications are that savings will accrue, especially when values are accredited to such items as: (1) one-man operation (Figure 8); (2) work load accomplishment through speed of operation and reduction of time required to bore deep holes; (3) preparation time for moving to new sites almost completely eliminated; (4) ease and speed of maintenance and servicing which can be done readily in the field or when truck is at a station—there is no auxiliary unit to keep in operation as power is supplied by the pickup engine; and (5)

probable increased work output by the operator as the rig is not physically tiring to run.

As many as fifteen 7½ foot borings have been made in less than 1½ hours in heavy clay.

Seven-foot to ten-foot piezometers can be inserted in the soil in less than one minute. The usual soil disturbances accompanying hammering in of piezometers do not show up when using the new auger.

The construction cost of this new power auger is about $1,450.00.

Work Quality Improvements

Diameter borings of six inches or larger give more accurate field determinations than smaller holes. Visual observations of water bearing aquifers can be made in the larger holes. Depths to strata can be measured.

Large augers are easily cleaned and there is less contamination within the samples. Six inch and eight inch diameter holes eliminate inaccuracies caused by the mixing action which occurs when soils are dry. Textural determinations can be made in large bored holes about as easily as those in spaded holes.

A New Mud Auger

In view of the power available in the new auger unit for meeting a wide variety of field conditions, efforts were directed toward developing a new orchard-type auger. Orchard augers work well in wet, sticky clays, but there are difficulties encountered in removing samples and in cleaning so that next increments are not contaminated.

Gene Novak and Everett Gregg were successful in developing a new orchard-type auger which works well under the most severe sticky clay conditions (Figures 9 and 10). The problem of cleaning is taken care of by a split three-inch barrel hinged open by a lever attached to the auger shank (Figure 9). The cutting edges of the auger lap under the split jaws of the barrel when closed and prevent spreading when the auger rotates. The lever snaps past center and tightly locks the barrel segments when closed.

Hal Hill, soil scientist in the Fresno Work Unit, dubbed the auger, **Alligator.** Well named it is; this auger can chew holes in a hurry. The Alligator auger takes a sample comparable to a core sample under moist or wet conditions—the soil is relatively undisturbed and in a nearly true position (Figures 10 and 11). A full two-foot increment can be taken at one time. Accurate texture determinations and positions of horizons in the soil profile can be observed by laying the increments on the ground.

These soil-investigation implements are not the ultimate, but their improved features of adaptability, versatility, economy and safety should be of interest to soil surveyors and scientists.

How Type of Soil Frost Affects Infiltration

GEORGE R. TRIMBLE, JR., RICHARD S. SARTZ AND ROBERT S. PIERCE

HARD-FROZEN ground at times of heavy rain and quick-thawing snow often causes surface runoff with resultant increases in flood hazard and accompanying loss of potential ground water. Thus, in the Northeast or in the other cold regions, ground freezing may have an important effect on streamflow and ground-water storage. Indications are that its single most important effect may be in augmenting flood flows.

Investigators have felt that the inhibiting effect of frozen ground on infiltration depends to a considerable extent on the *type* of ground freezing. Four terms have been used to describe the structure or type of soil frost: *concrete, granular, honeycomb,* and *stalactite.*

Concrete frost is characterized by an extremely complex formation of a great many thin ice lenses. Ground with concrete frost is hard, very hard, like concrete. This is the characteristic frost formed in bare agricultural land.

Granular frost is typically found in woodland soils that contain organic matter. It consists of small frost crystals intermingled with the soil particles. These grains aggregate around the soil particles, but remain separated from each other. Clods are easily broken up.

Honeycomb frost has a loose, porous structure resembling honeycomb. It is most commonly found in highly aggregated soils.

Stalactite frost consists of loosely fused, columnar ice crystals. It often forms in bare ground that is saturated at the surface. Honeycomb and stalactite types are less common in the Northeast than either concrete or granular frost. Neither was investigated in this study.

Two studies of runoff and infiltration made under winter conditions in forest and open land have indicated that infiltration is decreased by ground freezing in open land, but is less affected under forest cover. In one study (5), the open area was described as frozen, and the forest area unfrozen. In the other (2), both areas were frozen, but the assumption can be made that the open land contained concrete frost and the woodland area contained granular frost; at least, this is often the situation in the Northeast.

The American Society of Civil Engineers' *Hydrology Handbook* states that "freezing of soils does not invariably result in an impermeable medium; soils of low moisture content often become granulated and more permeable; and very wet soils have a greatly reduced permeability" (1). Byrnes, working with soil cores in a laboratory, found that concrete frost in mineral soil prevented percolation, while honeycomb frost in litter and granular frost in humus allowed water to enter (3).

The authors are with the Northeastern Forest Experiment Station of the Forest Service, U. S. Department of Agriculture, Upper Darby, Pennsylvania.

Scope of the Study

In the winter and spring of 1957, approximately 100 ring-infiltrometer tests were made in New Hampshire to study the infiltration characteristics of the frost types commonly found in both open land and forest land. The objectives were to determine if concrete frost as identified in the field was impermeable under both forest and open-land conditions, and to find out to what extent granular frost affected infiltration.

The other two frost types did not appear to warrant investigation. Honeycomb frost appears to be confined largely to litter if it can be distinguished from granular frost at all in this region. Stalactite frost is unimportant to infiltration as it is obviously of an open porous nature, transient in time and of very limited areal occurrence.

Four to 14 ring-infiltrometer runs were made at each of six locations under both frozen and unfrozen conditions with a double-ring infiltrometer (Figure). The diameters of the rings were 4½ and 12 inches. The outer ring could not be used successfully in concrete frost. For a run to be valid it was necessary to have the inner ring form a water-tight seal between the soil inside and outside the ring, otherwise water would leak from the inner ring and given an erroneous reading. Such leaks could not be detected when the outer ring was used.

The infiltrometer runs were made on the soil surface; only the litter was removed. All runs were "wet runs," in that the ground surface was thoroughly wetted before the timed runs were made. Ring-infiltrometer rates cannot be considered to simulate actual rates at which soil can take up rainfall. The rates are only relative and were used solely for comparison purposes on frozen and unfrozen ground at a specific location.

Concrete Frost Is Impermeable

The results of these runs are summarized in the Table.

Ring-infiltration rates (mean rates), in inches per hour

Cover	Soil texture	Freezing conditions		
		No frost	Granular frost	Concrete frost
White pine	Sandy loam	50	204	0
Hardwood	Loam	14	66	0
Abandoned pasture	Sandy loam	9	—	0
Hardwood	Sandy loam	30	—	0
Red spruce	Sandy loam	14	—	0
Lawn	Sandy loam	11	—	0

The data show that concrete frost is impermeable. Although a few runs indicated some water movement, detailed examination showed that either the water was

leaking out below the edge of the ring where it was in contact with the ground, or that there was a root hole or an animal burrow extending from the surface of the ground through the layer of frozen soil.

In the first case, there was no actual infiltration, as we found when we ran the tests using only the single ring. In the second case, water moved through holes so large that they are normally free of water and therefore do not freeze. This is a natural condition of the forest floor, and was found only in forest soils. These large holes, frost-free, offer passageway to surface runoff water even when the surrounding soil is concretely frozen. How much they affect the overall runoff pattern is not known.

The study also showed that granular frost had a higher infiltration rate than unfrozen ground in the two areas where comparable tests were made. The differences were large and statistically significant. This result agrees with the statement in the ASCE Handbook. It also bears out observations that soil appears more aggregated when it contains granular frost than when it is unfrozen.

Concrete frost when found in the woods is also apt to be much more spotty under most conditions than in open land. Thus any surface water running off the concretely frozen areas in the woods generally has but a short distance to go before reaching unfrozen soil. This is more apt to occur in hardwood than in softwood stands because it has been found that the latter generally contain more extensive areas of concrete frost.*

It was observed during our study that not only does concrete frost melt from above and from below, as has been brought out by Kienholz (4), but also that it changes internally—at least in a number of observed instances. While remaining unchanged in appearance, at least to the naked eye, it gradually loses its hard rock-like consistency and may be easily broken by hand. In the case of pasture soils with a great number of grass roots, it becomes pliable and can be bent. Concrete frost eventually becomes quite friable before it melts completely. At some point in this degenerative process, frozen ground becomes permeable to water. Of course, once it loses its concrete-like hardness the definition, concrete frost, is no longer applicable.

*Pierce, Robert S., Lull, Howard W., and Storey, Herbert C. *Influence of land use and forest condition on soil freezing and snow depth. (Now being prepared for publication by the Northeastern Forest Experiment Station.)*

Double ring infiltrometer in use on old pasture.

During times of thaw the melt pattern in some areas of concrete frost was very erratic, resulting in a close intermingling of frozen and unfrozen ground. This condition appeared to be associated with differences in micro-relief, which permitted certain micro-aspects and slopes to receive more solar radiation and thus to melt sooner.

Summary. Concrete frost in the forest and open was impermeable, but in the forest it was traversed in places by large open holes that allowed water to enter the soil. Granular frost was more permeable than unfrozen soil.

LITERATURE CITED

(1) American Society of Civil Engineers. 1952. *Hydrology Handbook.* ASCE Manual of Engineering Practice No. 28. 184 pp.

(2) Augustine, M. T. 1941. *Infiltration runs on frozen ground.* Soil Sci. Soc. Amer. Proc. 6: 435.

(3) Byrnes, William R. 1951. *Effect of soil texture on occurrence and type of ground freezing.* Jour. of Forestry 49: 786. (Abstract of thesis.)

(4) Kienholz, Raymond. 1940. *Frost in forest and open in Connecticut.* Jour. of Forestry 38: 346-350.

(5) Spaeth, J. N., and Diebold, C. H. 1938. *Some interrelationships between soil characteristics, water tables, soil temperatures, and snow cover in the forest and adjacent open areas in south-central New York.* Memoir 213, Cornell University Agric. Exp. Sta. 76 pp., illus.

FIELD NOTE BRIEFS

National Inventory of Soil and Water Conservation Needs

The National Inventory of Soil and Water Conservation Needs launched in August by the U. S. Department of Agriculture will be made in all counties in the nation and the Territories. Completion is scheduled for December 31, 1959, with periodic revisions planned thereafter.

The Inventory will include two major types of estimates (1) an inventory of land use, conservation problems and acreage needing treatment, and (2) an inventory of watershed project needs. The first type estimates will be made for all lands (except federal non-croplands). The second type of estimate will be developed for watersheds of a type and size specified in Public Law 566, as amended.

Eight USDA agencies are represented on the Department committee. They are Agricultural Conservation Program Service, Agricultural Marketing Service, Agricultural Research Service, Commodity Stabilization Service, Federal Extension Service, Farmers Home Administration, Forest Service, and Soil Conservation Service, which is the chairman agency. This committee is responsible for developing policies and procedures, guidance to the State Needs Committees and review and analysis of the work in the states.

State and Territorial Soil and Water Conservation Needs Committees have been organized to supervise and assist in the county inventories. In addition to USDA, state agencies and groups and other federal agenices, such as those in the Department of Interior, are represented on the State Needs Committees. The membership varies from state to state but includes those agencies and groups concerned with soil, water, forest, range and wildlife conservation. Work plans for carrying out the inventory are being prepared in all states.

The county inventories will be developed by local committees comprised of county-level representatives of Federal, State and local agencies, including soil conservation districts, agricultural stabilization committees, drainage and irrigation districts, and others. The county inventories will be based on soil survey and other information.

Expected land use changes and needs will be geared to projected food and fiber requirements for the nation.

The inventory will provide basic facts never before available on a nation-wide scale about our soil and water and watershed problems.

Land Resource Map of South Carolina Available

An up-to-date map of land resource areas in South Carolina has been prepared by Dr. G. H. Collings, head, department of Agronomy, Clemson College, and P. H. Montgomery, state soil scientist, Soil Conservation Service.

This map and related information have been published by the South Carolina Experiment Station as Circular 112. Copies are available from the S. C. Experiment Station, Clemson, South Carolina.

The map shows three main soil provinces: *the Blue Ridge Mountain Province,* which has only one land-resource area; *the Piedmont Plateau Province,* which has 10 land-resource areas; and *the Coastal Plain Province,* which has 26 land-resource areas.

There is considerable additional information on the back side of the map covering dominant soil series, subsoil texture, drainage, erosion, slope, depth of soil, parent material and descriptions of land resource areas in the state.

The soils in each of these areas may be grouped into various land-capability classes; eight are recognized, depending upon the extent or size of the hazard or limitations a farmer would meet in farming. These eight classes are designated by Roman numerals I, II, III, IV, V, VI, VII, and VIII. Capability Class I presents the least hazards to farming.

Three subclasses are recognized in South Carolina depending upon the kind of hazard: (*e*) indicating that erosion is the main hazard; subclass (*w*) indicating that excess water is the main hazard or limitation; subclass (*s*) indicating that the presence of a very sandy and drouthy condition or soil of low fertility are the main hazards or limitations. The principal land-capability classes and subclasses in each land resource area are given.—E. N. MILLER, JR., *S.C.S., Columbia, S. C.*

Some Conservation Economics

At the recent 1958 annual meeting of the National Association of Soil Conservation Districts, one questioner raised a storm during an education meeting. The question brought out a lack of economic studies in the conservation field.

Before too long economists will come up with studies that should be helpful to a better understanding of this complex and "dynamic" question of "does conservation pay?"

An early February news release from the Pennsylvania Department of Agriculture (Harrisburg) states that all taxpayers benefit from soil conservation districts.

This statement was derived from a Pennsylvania Department of Highway survey conducted in York County. The survey shows that it costs $116 a year to maintain 1,200 feet of highway in an area where farmers don't practice conservation, whereas costs were only $9 yearly for 1,200 feet where erosion is reduced through conservation practices.

In Pennsylvania, patterns of cooperation are developed by agreements between the highway department and each of the 48 soil conservation districts.

Landowners Should Protect Drainage Interests

Illinois landowners frequently find their land drainage seriously affected by rapid growth of urban subdivisions, industrial developents and new highway right-of-ways.

It's important that they keep informed about any proposed changes that may affect their farm drainage systems. Usually they must either cooperate in forming new plans or raise objections before construction is under way.

The basic principle of Illinois drainage law is that a landowner must receive surface water flowing naturally from higher ground.

A landowner faced with this problem can often benefit by cooperating in the drainage changes. At least he can help to hold the damage to his system to a minimum. For example, he may be able to have an outlet storm drain extended through his field to a ditch instead of opening onto the field, or he may be able to use it as a tile outlet.

Paved drives, streets and roofs usually produce higher runoff rates than farm lands, but this extra flow can legally be discharged into natural drainage outlets. Affected landowners usually gain more by cooperating than by opposing such cases.

On the other hand, newly developed projects designed to drain in a direction through which the area does not drain naturally are normally contrary to the basic drainage laws of Illinois. A landowner who is affected by such a proposal should either register an objection with legal counsel or demand payment of damages if drainage through his land seems necessary.

Highway departments are often involved in these cases but their interests frequently are not the same as those of affected landowners. Landowners therefore should not depend on the approval of highway officials to protect their land.

Legal action taken before construction starts, rather than later, will result in greater satisfaction to both parties. **In many cases both costs and damage may be greatly reduced by cooperation during the planning stages of the project.**

Rural Development Program

In many underdeveloped rural areas, efficient use of resources means the difference between low-income and prosperity, even where natural resources are limited. One agricultural economist has put it this way: "The quality of the local farmland is frequently of little importance in explaining the existence of community-wide rural poverty. Unfavorable soil, topography, and climate have not prevented (some areas) from attaining a high level of average family incomes." The crucial question is what farmers do with natural resources.

In the Rural Development Program, we are making a special effort to emphasize efficient land, water, and forest resource use to promote the development of agriculture's human resources.

(From "Progress in the Rural Development Program", First Annual Report of the Secretary of Agriculture (Washington, D. C.) September 1956, page 14.)

Tree Farming

The Tree Farm movement started just 16 years ago is growing up.

From Montesano to Miami, from Kennebunk to California, landowners are waking up to the fact that money really grows on trees and that woodlots can improve watershed, wildlife and recreation conditions.

In the United States today there are some 4,461,274 "small" woodlot owners whose holdings are under 500 acres. They hold 61 per cent of the country's commercial forest land. Each year they take to market and sell $700 million worth of sawlogs, pulpwood, posts, turpentine, Christmas trees, maple syrup and other forest products.

"Recovering Rainfall"

Elimination of the heavy vegetation on Arizona watersheds can help satisfy the thirst of the State's agriculturalists for water. This is the theme of a report issued by the Arizona Watershed Program staff, a group representing the State Land Department, the Salt River Valley Water Users' Association, and the University of Arizona, according to a news release received from the Wildlife Management Institute of Washington, D. C.

The study sponsors make no secret of their objective. They want more water for irrigated farming in the Salt River Valley watershed near Phoenix where for many years more water has been pumped from underground sources then is returned to the soil by precipitation. The average depth of the irrigation wells in 1948 was 125 feet; the wells now probe to 250 feet in an effort to keep contact with the shrinking ground water supply.

The report is **Recovering Rainfall** and it was authored principally by Dr. George W. Barr, head of the department of agricultural economics, University of Arizona.

A proposed action program "includes a drastic thinning of ponderosa pine stands, management chiefly for water yield of many pine areas of low productivity, thinning of spruce to favor snow deposition, expanded eradication of juniper and pinyon-pine, and the modification of stream-side vegetation to reduce the loss of water between the point of production and the reservoirs. As a result of the application of this program, it is expected that about 285,000-acre feet more water can be obtained per year from the Salt River watershed."

All other watershed values—timbering, grazing, recreation, wildlife, and fishing—would be subordinated to shaving the watershed in an effort to stimulate both insoak and water runoff for more water for irrigation. Unless more water is made available, the report advises "abandonment of at least 500,000 acres of the State's farm land valued at more than $250 million appears inevitable within the next 10 years."

The many other persons whose livelihood and well-being depend on the watershed are beginning to ask questions concerning soil erosion, floods, and accelerated destruction of storage reservoirs through premature siltation. These questions, if answered, require much cooperative research.

Adjustments in Southeast

Southeastern farmers are seeking new horizons. They are making major changes in their farming systems; cash crops have a lesser role; feed grains, livestock, poultry, fruits, and vegetables are becoming more important. The transition is neither painless nor smooth and is not being made quickly. Thousands of farm families must adapt themselves to new conditions—new types of decisions, new interests, new tasks, new markets, new capital, new costs. Problems are numerous: Some involve poor physical resources like lifeless soils and exceedingly small farms. Some involve a lack of funds for buying a truck, a hay baler, a brood herd. Some involve inadequate skills for modern farming—for controlling insect pests, for expediting planting, cultivating, and harvesting operations, and the like.

Solutions to such problems depend on people who can think and act. People on farms have a special role in gaining new horizons because they control and use farm resources. Other people can help farmers overcome their problems and achieve their goals. To do so, however, they need to know what the farmers are like, their number, age, tenure, education, labor force, whether they have off-farm work, and how much. Knowing these things provides insight into farmers' problems and helps people to better serve and develop our farm economy.—*Banker's Farm Bulletin,* January, 1958.

Louisiana Watershed Dedicated

The first completed portion of the Bayou Dupont Watershed was dedicated October 29, 1957. There were approximately 500 people present, including farmers, business men, bankers, SCS technicians, agricultural workers and others.

The honored speaker for the dedication was Nolen J. Fuqua of Duncan, Oklahoma, national president of the National Association of Soil Conservation Districts.

The construction schedule calls for completion of 22 reservoirs and a floodway by 1961. The Natchitoches Parish Police Jury and the Sabine Parish Police Jury have jointly agreed to assist in the maintenance of these structures in the Bayou Dupont Watershed.

There are 57,610 acres in the watershed of which there are 8,854 acres in bottom land, 547 acres in permanent pools and 2,129 acres in flood pools when completed, with 74 per cent of the watershed presently in woodland. When completed the total cost is estimated to be $1,966,229.00 of which the Federal Government will pay $888,225.00 and the local people will pay $1,078,004.00.

Private Waters in North Carolina

The Wildlife Resources Commission of North Carolina has made an important change in the regulations regarding license requirements in private waters, affecting hundreds of farm-pond owners and thousands of anglers.

The original wording of the regulation was set forth a number of years ago when farm ponds were few and far between, and farm ponds were an insignificant part of the Commission's wildlife conservation program. Since that time farm ponds, many of them coming under the definition of "private waters," have been constructed by the thousands.

At the same time the demand for farm pond management services and protection grew, the people who served most to benefit by these services were for the most part exempted from supporting the program through license fees.

There have been, and still are questions regarding the definition of private water. North Carolina law gives a clear definition. But, for purposes of further clarification, the Commission uses this definition: **"Private Waters: Bodies of water arising and lying wholly upon the lands of a single owner or a single group of joint owners or tenants in common and from which fish cannot escape and into which fish cannot enter from public waters at any time."**

Planning for Water Takes Time

New York assembly speaker, O. D. Heck, has stated:

"It would seem that New York State, with its great water resources, should be free from water supply problems. Unhappily this is not wholly true. . . .

"Taken as a whole, the region with the most pressing water supply needs is a belt roughly 50 miles wide directly south of Lake Ontario and extending eastward from Lake Erie and the Niagara River through the Syracuse metropolitan area. . . .

"The development of a water supply is a slow process. To have water ready, planning must begin ten to twenty years ahead."

To Continue Seepage Loss Study

Studies to determine best methods of sealing irrigation canals and ditches against costly seepage losses will be continued by Colorado State University under terms of a $4,000 contract awarded by the Bureau of Reclamation.

The award is the fifth provided by the bureau to help support a continuing study of some phases of the seepage loss problem in the West. The project is being administered through the Colorado State University Research Foundation. Project leader is R. D. Dirmeyer.

The new award will help finance a laboratory study of dune sand materials collected from a field site in the Torrington, Wyoming, area. These materials will be brought to the CSU campus for observation on the effectiveness of such materials as bentonite and other similar additives in preventing seepage losses.

Work done under previous grants, including those by the Bureau of Reclamation, the Agricultural Research Service, other agencies and irrigation groups, has shown that in the majority of cases, seepage losses can be cut from 50 to 90 per cent in leak channels through the use of low-cost bentonite.

The process involves mixing the bentonite in the irrigation water. Once suspended in the water, the bentonite is carried on down stream and filters out to help seal the channel.

However, low-cost material has not worked in all situations. Among some 25 field tests now being conducted, results have been generally favorable, but in some instances the bentonite has not solved the seepage problem. Some adaptions will be needed to meet different problems presented when canals run through varying soil types.

General Semantics Note

"Dissimilarity'" is the common characteristic of agriculture. To apply a "comprehensive" approach to the development of effective and workable farm programs is to imply similarities that do not exist.

Thus, Gordon Zimmerman, research director of the National Grange, and SCSA member, opened his explanation of the commodity-by-commodity approach to the farm problem when testifying before a Congressional Subcommittee on Agricultural Policy.

More complete details of Zimmerman's statements can be obtained from the National Grange, 744 Jackson Place, N.W., Washington 6, D. C.

Book Reviews

"Literature arrests the rapid flow of experience, holds it up for contemplation and understanding. Literature enables one to share the experience of men of all ages. Men who have been confronted with human problems and conditions of life common to men." When more publications on ecology appear, and when more publications on applied ecology (management) appear, then men will become exposed to the living-resources' background of the drama of human life. Is this background being pushed out of consciousness by our present urban culture?

INTERPRETING OUR HERITAGE. *By* FREEMAN TILDEN. *University of North Carolina Press, Chapel Hill, N. C. 110 pages, illustrated, index. Foreword by Conrad Wirth; Preface by Christopher Crittenden. 1957. $3.50.*

A news item caught my eye a short time ago: "Civil Service approves salary hikes." The article continued: "Government chemists, physicists, mathematicians, and engineers to receive substantial increases." Good for them. I read on, and found that no other groups of professionally trained men were mentioned. Biologists, agronomists, soil chemists, bacteriologists, plant physiologists, and several dozen other "—ists" were absent. Can it be that in this frenzy of Sputniks and ICBMs we as a nation have forgotten our dependence on the fundamental resources of soil and water and the many wondrous living things? That news item is but one of many signs pointing toward the answer "yes." It was with this disturbing thought in the back of my mind that I read Freeman Tilden's **Interpreting Our Heritage**. A book more apropos could not have come to hand.

The thousands of readers of this JOURNAL are, in the main, technically-trained individuals: field men, researchers, administrators, specialists all. With this fullness of specialists we've solved many a knotty problem, developed many a device or practice to increase productivity. But haven't we "missed the boat" in solving the biggest problem of them all: that our urbanized citizens have little or no appreciation of "feel" of the very basic nature of soil and water. Certainly vast educational efforts are being made, and many *Society* members are involved.

But are educational efforts alone enough? We certainly need to impart knowledge; a much greater need is to instill appreciation, aside from specific knowledge. It is in this light that Tilden's book has considerable significance for all of us in resource management and education.

"Interpretation," writes the author, "is an educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information."

Freeman Tilden, long associated with the National Park Service, wrote **Interpreting Our Heritage** with the object of presenting major principles and practices for visitor services in places such as parks, museums, and historical areas. Yet the principles he summarizes so well are applicable to our efforts (and need) to create a complete generation of Americans that, while not necessarily versed in the techniques of soil and water management, at least will recognize the vital role of soil and water.

From the six principles in interpretation, discussed and illustrated in the first half of the book, to the consideration of broader aspects of this educational concept, the author develops some very sound and useful ideas. The chief aim of interpretation is not instruction (the imparting of specific detailed information) but is provocation. It strives to "stimulate the reader or hearer toward a desire to widen his horizon of interests and knowledge, and to gain an understanding of the greater truths behind any statement of fact."

Aren't we, every time we contact the public in any way whatsoever, interpreters (in Tilden's sense of the word) as well as educators or technicians? Would not our recognition of the need for interpretation, and a more conscious effort toward achieving it, be of inestimable value? Is not our major heritage the *good earth* itself? The answers to these questions are evident, I feel, and Tilden's thoughtful and also truly enjoyable book offers some sound help in our efforts and need to bring the public along with us.

—WILSON F. CLARK, *Billings, Montana.*

West Virginia Conservation Guide Published

Living, Learning, Loving West Virginia, an excellent new 80-page teacher's guide to conservation, has been prepared jointly by the State Department of Education and the Conservation Commission in cooperation with a state-wide committee of educators and consultants in the

hope of increasing conservation-mindedness among dwellers of the Panhandle State.

The purpose of the guide, the publishers say, "May be thought of as three fold: First, that of emphasizing the important function of the school in developing desirable attitudes and habits of living in relation to conservation as a way of life; second, that of aiding teachers toward a better understanding and appreciation of our natural resources; and third, that of providing children the kinds of learning and experiences that will effectively lead to the desired goals in conservation education."

The guide is developed in sections corresponding to the primary, intermediate, junior high, and secondary school levels. Five major natural resources groupings—soil, water, forests and plant life, animals, and human resources—are presented in each section with statements on natural resources concepts and accompanying lists of suggested pupil activities.

Recommended bibliographies of films, records, and books are included at the end of each section. Additional sections list the local organizations that can be called upon for assistance in developing a human resources teaching unit, and general instructions are given on conducting field trips. A closing section helpfully presents a sample outline to assist teachers in the preparation of a conservation teaching program.

Well illustrated, comprehensive, and clearly written, **Living, Learning, Loving West Virginia** appears to be an invaluable guide for teachers interested in presenting a broad conservation education program. Inquiries should be addressed to the Conservation Commission of West Virginia, in Charleston.—OUTDOORS NEWS BULLETIN, *12-6-57*.

OF MEN AND MARSHES. BY PAUL L. ERRINGTON.

The Macmillan Company, 60 5th Avenue, New York 11, New York. 1957. 150 pages, illustrated by H. ALBERT HOCHBAUM. $4.50.

Dr. Paul L. Errington is a professional ecologist and known world-wide for his research on dynamics of animal populations. He is a professor at Iowa State College, Ames, Iowa.

Researchers of Errington's calibre, sensitivity and broadness of view are rare. Rarer still are publications such as **Of Men and Marshes**, wherein is set down in intimate beautiful prose some of the thoughts of a scientist: thoughts that are never exposed in the more pedantic "scientific" journals or publications.

An introductory quote from **Of Men and Marshes** reveals why the author had to write his book (it expresses a view "held by many thoughtful people"): ". . . Civilized man could show some civilization by preserving in as natural condition as possible representative types of the different plant and animal communities before they are lost."

Errington goes on to clarify what he means:

"Such would mean going farther than preserving the mountain tops that no one would find exploitable, the lands too rocky or otherwise unsuitable for cultivation, the forested lands too inaccessible for lumbering, and the odd pieces of land having slight economic value that 'practical' man might not want. It would mean preservation of some places with the best timber or soils or building sites, some that could easily be plowed and kept plowed, some marshes that could be turned into cornfields. It would entail recognition of values other than the monetary.

"Apart from any esthetic appreciation that ecologists may feel toward undespoiled wilderness preserves, including marshes, one of their chief motivations in preservation of wilderness is to safeguard areas where ancient interrelationships of plants, animals, soils, and climates may be studied. It is to safeguard areas where comparisons may be made between plants and animals subject to all degrees of human land use and those that live undisturbed (or relatively undisturbed) by man and man's. Their [ecologists'] thesis is that important things may be learned about laws of life from wild populations living on wild areas."

Paul Errington also pleads for reversal in the drainage trend; he notes that there are values other than personal profit; that the American public needs "to strive for balanced judgment rather than to swing back and forth from extreme to extreme in our handling of water."

This reviewer has had working familiarity with marshes for 20 years in at least six states of eastern and central North America, and has developed conclusions and aesthetic feelings similar to those expressed by Errington.

Ponder well Errington's remarks in the preface to his book:

"Greater familiarity with marshes on the part of more people could give man a truer and a more wholesome view of himself in relation to Nature. In marshes, life's undercurrents and unknowns and evolutionary changes are exemplified with a high degree of independence from human dominance as long as the marshes remain in marshy condition. Marshes comprise their own form of wilderness. They have their own life-rich genuineness and reflect forces that are much older, much more permanent, and much mightier than man."

Errington's book has 12 parts, including a preface and epilogue. Marshes are considered in relationship to: *time, spring, summer, fall, winter, marshes, islands, safety*

and comfort, peace of mind, man and harmonious use, and the laws of life. Throughout he has given us a remarkable ethic and methodology concerning marshes.

Of Men and Marshes will eventually attain the stature of a classic. Today, this reviewer can think of no finer book to present to any person who works in the field with natural resources, whether these be animals, plants, soils or water, or combinations. Paul Errington feels "that there should be more in human experience than making a living."—D. E. WADE.

YALE CONSERVATION STUDIES. *Published by Yale Conservation Club, Yale University, New Haven, Connecticut. Volume 6, 1957. $1.00.*

Most of the items published in these volumes have been written by graduate students working under the general direction of Dr. Paul B. Sears, with the cooperation of other related department professors. The "essays" reveal much about the excellent "conservation" program now in its seventh year at Yale University.

A guest conservationist writes an introduction for each volume.

For Volume 6, William Vogt expounds on the matter of "pessimism". It will be remembered that Vogt is the author of **Road to Survival** (1948): a book that became a best-seller, has been translated into at least seven languages, and underwent severe criticism.

In one magazine article, Vogt was accused of being a "pessimist". Nevertheless, Vogt's viewpoint, expounded in his book and in this more recent publication, is aimed toward making it "possible for man to have space, peace and natural beauty, and to share them with the plants and animals that have been such an important part of our culture . . ."

The student expositions range widely: Resource planning—a problem in communication; community natural areas; land use in the Philippines; conservation education in the public schools; utilization of Connecticut's old field hardwoods; research methods in conservation; agriculture in a developing fringe area (impact of urbanization in Connecticut); Alaskan recreation—its potential and its development; aspects of strip mine reclamation; utilization of aquatic vegetation; Gorilla sanctuary in Southwest Uganda; Sulfur—an air pollutant and a resource; trails to tomorrow (development of conservation guides for teachers); agricultural possibilities of tropical soils; and spring in the desert.

More universities, with established conservation departments, should undertake publication of students' findings. Conservation is still very much of an art with an admixture of science.

The fresh viewpoints of students constantly enrich conservation concepts and methods. —D. E. W.

VERTEBRATES OF THE UNITED STATES. BY W. FRANK BLAIR, ALBERT P. BLAIR, PIERCE BRODKORB, FRED R. CAGLE, AND GEORGE A. MOORE. *McGraw-Hill Book Company, 330 W. 42nd St., New York 36, N. Y. 1957. 819 pages, illustrated, indexed. $12.00.*

It took at least seven years from inception of the idea to get this guide published. It will greatly facilitate the identification of fishes, amphibians, reptiles, birds, and mammals in continental United States, and its adjacent waters. Marine fishes and turtles have been omitted.

Considerable natural history and ecologic information accompanies the identification text.

Although intended primarily as a text for courses in vertebrates, this book should be on the shelves of all conservation field men who deal with biological aspects of land and water use. Vertebrates (of which man is one) play important roles and share with human beings the land and water areas of the world.—D. E. WADE.

Literature Briefs

DOCUMENTS ILLUSTRATIVE OF THE FORMATION OF THE UNION OF THE AMERICAN STATES. Originally published as House Document 398 of the 69th Congress, this 1115-page volume presents a collection of documents on the origin and development of our constitutional history.

Better familiarity with these documents should enable conservation workers to understand some of the problems of resource management and use. (Can be obtained from the Supt. of Documents, Government Printing Office, Washington, D. C. $9.50.)

THE WISE USE OF NATURAL RESOURCES. By David A. Shepard. The Atlantic Monthly, October, 1957, pp. 98-101.

Shepard is a director in Standard Oil Company (New Jersey). He discusses the measures which need to be taken, not only by industrial organizations and individual conservation groups, but by all segments of our society to conserve the natural resources of the United States.

A reprint of this stimulating essay may be obtained by writing Standard Oil Company (New Jersey), 30 Rockefeller Plaza, New York 20, New York.

WATER FOR THE FUTURE IN MISSISSIPPI. By the Mississippi Water Resources Policy Commission, Jackson, Mississippi. 1955. 63 pages, illustrated. Appendix treats resources and use of water obtained through surveys and questionnaires. (No price given.)

This is a well-prepared and illustrated report. Four figures are done in color: *watersheds of state, important aquifers, generalized geologic cross-sections,* and *water problem areas.*

A supplement published in 1956, gives details of legislative proposal for implementing the Water Policy of Mississippi.

WATER IN GEORGIA. By the Water Use and Conservation Committee. (Copies can be obtained from the State Soil Conservation Committee, Agricultural Extension Bldg., Athens, Georgia.) 1955. 85 pages, illustrated, four-part appendix: resolution on water law legislation; bibliographies on water rights, miscellani and water resources.

This is a report on the historical, physical, and legal aspects of water in Georgia. It is interesting to note (page 53) that ". . . Human limitations of viewpoints are unquestionably the greatest difficulty that we face in the wise use of our water resources in Georgia."

IRRIGATION TRAINING GUIDE. Compiled and edited by Edgar L. Wright, W. H. Berry and W. D. Criddle. Bureau of Indian Affairs. Washington, D. C. 75 pages, illustrated, references. 1957. Price 75 cents. (Looseleaf.)

Another in a series of basic educational guides designed to be used by vocational agriculture teachers and technicians working with farmers and ranchers. Based on a school held in 1955.

YOUR OWN FISH POND is the latest booklet to come to our attention on how to locate, build, manage, and fish artificial fish ponds. It's a 31-page 6 x 9-inch booklet, written by fish and wildlife extension specialist Earl Kennamer.

It's especially designed to meet needs in Alabama, but contains much information of use to pond owners elsewhere.

The foreword cites these gains to be expected from a good farm fish pond, per acre: 100 to 150 pounds of good food; 300 hours of healthful sport and relaxation; $50 to $300 income in fishing rights; $60 to $80 income if fish are marketed; and, an increase in value of your farm.

To get a copy, write to the Extension Service, Alabama Polytechnic Institute, Auburn, for Circular 528.

CONSERVATION IS GOOD BUSINESS. Natural Resources Department, Chamber of Commerce of the United States, Washington 6, D. C. 35 pages, illustrated. (Not dated, but probably issued in 1957.) Prices range from 50 cents for single copies to $30 per hundred.

Thirteen authors prepared the various sections on oil, natural gas, lumber, pulp and paper, hydro, steam and atomic power, mining, and grazing.

This is an interesting publication, although some parts might be interpreted by some students of conservation as being propaganda.

Today, conservation problems are involved and complex. Conservation of American resources needs the help of industry; education needs always the guiding hand of truth.

WISCONSIN'S RENEWABLE RESOURCES. By James A. Larsen. University of Wisconsin, Madison. 160 pp., illustrated, references. 1957. (No price given.)

This report is for limited distribution, but is most worthy of notice. Text, typography and use of half-tones are superb.

It covers recent research, with some historical perspective, in the renewable resources of field, forest, lake and stream.

A primary position is given to the concepts and values of wilderness and natural areas. Leadership along this line has been outstanding at the University of Wisconsin.

Other topics reported include: ecology, prairies, oak forests, disease and insect threats, rural zoning, wildlife, early lake studies, fish and water management.

MAJOR USES OF LAND IN THE UNITED STATES: SUMMARY FOR 1954. U. S. Department of Agriculture Information Bulletin No. 168. January 1957. Washington, D. C. 102 pages. (No price given.)

An account of the extent and distribution of the major agricultural land uses and a general analysis of the situation in the United States as of 1954. There are 21 summary tables for the United States as a whole and 22 tables on major land use by states, as grouped by regions. Eight figures aid in graphic interpretation of data.

SOILS AND LAND USE, HARTFORD COUNTY, CONNECTICUT / An area of specialized agriculture and rapid urbanization. By Alexander Ritchie, Jr. and C. L. W. Swanson. Bulletin 606. October 1957. Connecticut Agr. Experiment Station, New Haven, Conn. 36 pages. (No price given.)

This is a case study of the relation of modern soil survey to land use. Research in soils and land use is related to the changing pattern brought on by suburbanization.

FUTURE SUBURBAN PARKS / A sugtion to the International Recreation Congress at Philadelphia. By Robert Moses. September 30, 1956. (No price given; may still be available from New York City Planning Commission.)

This is an appeal for intelligent planning and foresight in the matter of getting areas set aside for parks. The march of urbanization is presented in some excellent aerial photographs.

TIMBER RESOURCE REVIEW. Forest Service, Washington, D. C. 28 pages. June, 1956. (No price.)

This is a commentary guide for color slides and charts based on the most recent study of the national timber situation. Slides are presumably made available through various federal and state forestry officers.

This guide is worthy of study not only for the information on timber, but for the techniques developed in trying to tell a story of an involved survey, replete with projections into future demands and supplies.

TIMBER RESOURCE REVIEW. Forest Service, Washington, D. C. Nine chapter-volumes. 1955. (Preliminary drafts.) (No prices given.)

Chapter I, **Timber Resources for America's Future**, and Chapter IX, **Appendices / Summary of Basic Statistics**, are the two volumes of value to readers interested in the most recent timber survey in the United States.

CENTRAL STATES TIMBER RESOURCES. Forest Service, Central States Forest Experiment Station, 111 Old Federal Building, Columbus 15, Ohio. 30 pages. 1957. Illustrated.

This is an analysis and report for the central states region of the 1952-55 Timber Resources Review (TRR). Similar compilations are available for other Forest Service regions of the United States.

HOW TO FARM YOUR FOREST. By Leon S. Minckler and John S. Hosner. Southern Illinois University, Carbondale, Illinois. 1956. 68 pages, illustrated. (No price given.)

Parts of the Midwest have neglected management of small woodlands on private lands. Efforts are now being made to encourage better management on such woodlands.

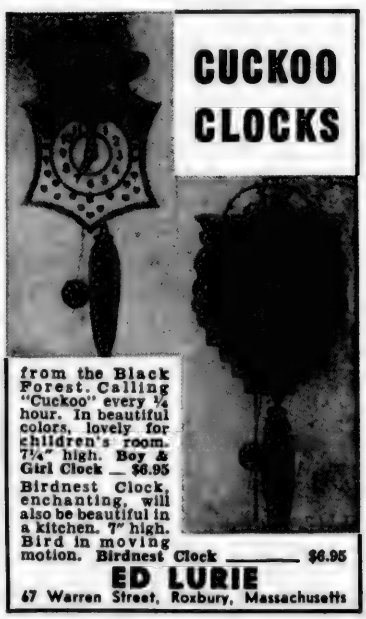
It is encouraging to see an increase in attention to conservation by more and more universities and colleges. In the past twenty years Southern Illinois University has become a real force for improved resource management in southern Illinois. Forestry work started in earnest in 1950 at this university.

Throughout the Midwest, great opportunities exist for improvements in small woodlands management.

CONSERVATION ADVENTURES WITH DICK AND DEBBIE: A Youthful Journey Through Vermont. Department of Education, Montpelier, Vermont. 1957. 24 pages, illustrated by many half-tone cuts. Cover has two full-color reproductions.

This publication is aimed at the school children of Vermont. It was sponsored by the Soil Conservation Districts of Vermont with additional help in expense of publishing from eleven firms and persons.

Should be of value especially on a junior high school level.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CLOCKS
from the Black Forest. Calling "Cuckoo" every ¼ hour. In beautiful colors, lovely for children's room. 7¼" high. Boy & Girl Clock — $6.95
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ED LURIE
67 Warren Street, Roxbury, Massachusetts

News Notes

President's Column

Occasionally a member asks "How does the *Soil Conservation Society of America* operate?" The affairs of the national *Society* are managed by a council of thirteen members. There are eight councilmen—one from each of five regions and three elected at-large. Then there are the four elected officers plus the immediate past-president. This council meets twice each year to conduct business. In order to handle urgent matters there is an executive committee composed of the officers. The employed executive secretary and JOURNAL editor work closely with the council. It is their function to carry out policies and programs adopted by council. The executive secretary is the administrative officer of the *Society*.

Most phases of program planning and techniques for implementing programs are developed and carried out by committees. At the present time there are nearly 30 active committees comprising about 500 *Society* members. In addition, during the year there will probably be a number of special committees. Some committees make recommendations to the council which takes such action as is deemed advisable. Responsibilities for carrying out these recommendations are assigned to other committees or to the administrative staff. Nearly all suggestions to the 95 chapters for certain activities have gone through this process.

Over the years it has been my opinion there is such a volume of suggestions and recommendations from committees that the council has not had sufficient time to give them adequate consideration. Therefore, this year a program development committee has been established under direction of the first vice-president to more carefully evaluate committee recommendation and past council actions. From this review should come a more adequate program that recognizes committee thinking and council considerations.

Another new committee this year is the *Society's* public policy committee. Several years ago the *Society* discontinued the use of resolutions at the annual national meeting. Since that time the *Society* has never taken an official position on any public conservation issue. Last fall the council decided to develop its position on certain national issues through a public committee. Chairman of this committee is Lloyd Partain. Working with him are J. S. Russell, Firman Bear, R. Y. Bailey, and R. K. Bliss. This is a committee of conservation statesmen. It will be this committee's responsibility to develop techniques for getting chapter membership opinions on public conservation affairs and to compile these opinions into a council recommendation for official acceptance.

The *Society* has an agreement with the International Cooperation Administration to work with foreign individuals interested in soil and water conservation. We also have membership on the Natural Resources Council, the Joint Committee on Grassland Farming, the American Association for the Advancement of Science, the Policy Committee for Scientific Agriculture Societies, National Watershed Congress, and the International Union for Conservation. We are also seeking membership on the Food and Agriculture Organization Conference.

I hope this description gives you a better understanding about the operations of your national *Society*.

Just another word for this issue. Your *Society* took a major step last year when it employed a full-time editor. This has placed a heavy burden on *Society* finances. We need all-out assistance on JOURNAL advertising, membership and publication sales to meet new obligations. Our JOURNAL distribution warrants doubling our advertising income; our 1958 goal is 10,000 *Society* members; our present publications are outstanding and new ones are being prepared. These are opportunities not only for increasing income but also to widen our scope of influence among those interested in good land and water use.—RUSSELL G. HILL, *President*.

Coming Events

The International Union for Conservation of Nature and Natural Resources will hold its Sixth Session of the General Assembly from 11 to 19 September 1958 in Athens, Greece. The *SCSA* is a member of the Union and has several members on the IUC planning group and will be represented at this Assembly. Further details can be obtained from IUC, 31, rue Vautier, Brussels, Belgium. The two major "Themes" for the meetings are "Soil and Water Conservation" and "Education and Conservation."

The 1958 National Plowing Contest and Conservation Exposition will be staged August 21 and 22 on the 10,000-acre Hershey Farms near Harrisburg, Pennsylvania. Details can be obtained from either Ralph E. Patterson or Ralph W. Hunter at Pennsylvania State University, University Park, Pennsylvania.

The American Society of Agronomy, Soil Science of America, and **Crops Science Society of America** will be held at Lafayette, Indiana, on the Purdue University campus, August 4-8, 1958.

The Western Regional Branch of the American Society of Agronomy will hold its 1958 meeting at Logan, Utah (Utah State University) June 16-18. **The Northeastern Regional Branch of ASA** meets in Ithaca, New York, July 15-17.

National Land Judging Contest

The seventh National Land, Pasture and Range Judging School and Contest will be held at the Oklahoma City Fairgrounds, May 1 and 2, 1958. It includes a contest for 4-H Club and FFA members, adults, women and girls, and college students. The first day, May 1, will be a training school.

Object of this national event is to increase interest in soil and water conservation, pasture development and range management. In addition, the school is designed to improve the people's skills and develop new attitudes toward the better side of conserving our natural resources, particularly soil and water.

Further details, brochures or bulletins can be had from Edd Roberts, Extension Soil Conservationist, Oklahoma State University, Stillwater, Oklahoma.

Soil Stewardship Week is scheduled for May 11-18, 1958. Information and aids for this week can be obtained from the NASCD, League City, Texas.

★ ★ ★

Then, of course, don't fail to schedule your trip to Asheville, North Carolina, for the October 19-22, 1958, annual conference of Soil Conservation Society of America.

★ ★ ★

Trace-element Symposium

The February 1958 issue of *Soil Science* carries all the papers presented at the Trace-element Symposium of Agricultural and Food Division, American Chemical Society, Miami, April, 1957. Copies can be obtained at $1.00 each by writing The Williams and Wilkins Company, Mount Royal and Guilford Avenues, Baltimore, Maryland.

Annual Audit Reported by Treasurer Barrows

The annual audit of *Society* business transactions has been completed by Peat, Marwick, Mitchell & Co. for 1957. They are certified public accountants employed to audit financial transactions of the *Society* and have offices in the Hubbell Building, Des Moines, Iowa.

The report of the audit follows:

January 14, 1958.

National Council
Soil Conservation Society
of America, Incorporated
Des Moines, Iowa

We have examined the statements of cash receipts, disbursements and balances of the Treasurer's and Executive Secretary's Accounts, and the Reserve Account of the Soil Conservation Society of America, Incorporated, for the year ended December 31, 1957. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying statements of cash received and disbursed present correctly the cash transactions of the Treasurer's and Executive Secretary's Accounts, and the Reserve Account of the Soil Conservation Society of America, Incorporated, for the year 1957 and the cash balances at December 31, 1957.

PEAT, MARWICK,
MITCHELL & CO.,
Certified Public Accountants.

Exhibit "A"
Soil Conservation Society of America, Incorporated
Statement of Combined Cash Receipts and Disbursements
Treasurer's and Executive Secretary's Accounts
Year Ended December 31, 1957

OPERATING RECEIPTS:		
Membership Dues—		
1956 and Prior	$ 290.52	
1957	28,038.85	
1958	12,397.25	
Student	118.00	
Chapter Dues	829.00	
	$41,673.62	
Less—Chapter Dues Collected and Refunded	719.00	$40,954.62
Journal—		
Advertising	$ 8,152.23	
Sales and Reprints	1,267.41	9,419.64
Booklet Sales—		
"Story of Land"	$10,573.06	
"Down the River"	1,003.66	
"Watershed" Booklet	1,619.14	
Miscellaneous	1,384.85	
Glossary Sales	93.00	14,673.81
Other Receipts—		
Annual Meeting	$12,550.24	
Miscellaneous	582.47	
Emblem Articles	493.73	
Interest on Bonds	375.00	14,001.44
Total Operating Receipts		$79,049.51
OPERATING EXPENDITURES—Exhibit "A-1"		73,049.75
Net Operating Income		$ 5,999.76
ADD:		
Cash Balances—		
January 1, 1957—		
Treasurer's Account	$8,168.08	
Executive Secretary's Account	381.72	$ 8,549.80
Less—Net Transfers to Reserve Account	1,770.00	6,779.80
CASH BALANCES—DECEMBER 31, 1957:		
Treasurer's Account	$12,332.49	
Executive Secretary's Account	447.07	$12,779.56

Exhibit "A-1"
Statement of Operating Expenditures
Year Ended December 31, 1957

OPERATING EXPENDITURES:		
Executive Secretary's Office—		
Salaries	$14,478.26	
Society's Share of Payroll Taxes	299.78	
Society's Share of Executive Secretary's Life Insurance	309.42	
Executive Secretary's Travel	2,587.00	
Equipment and Supplies	5,712.99	
Rent and Utilities	2,261.51	
Insurance	312.77	$25,961.73
Journal—		
Editor and Assistants	$ 3,199.18	
Editor's Travel	446.55	
Printing	13,626.58	
Reprints	786.25	
Advertising Space Representation	200.42	18,258.98
Booklets—		
"Story of Land"	$ 5,250.83	
"Wonder of Water"	3,137.03	
"Watershed"	1,132.04	
Miscellaneous	950.80	10,470.70
Postage		2,457.49
Council Expenses		1,520.31
Book Sale Credit to Chapters		661.15
Freight and Express		178.28
Emblem Expense		445.57
Addressograph Service		333.53
Annual Meeting		12,320.49
Auditing		185.00
Membership Refunds		20.00
Miscellaneous		236.52
Total Operating Expenditures		$73,049.75

Exhibit "B"
Statement of Reserve Account Transactions
Year Ended December 31, 1957

	Total	*Savings Account*	*United States Treasury Bonds Series "G" At Cost*
BALANCE—January 1, 1957	$16,707.91	$1,707.91	$15,000.00
ADD:			
Interest Accrued by Bank	62.86	62.86	—
Transfers from Treasurer's Account	1,770.00	1,770.00	—
BALANCE—December 31, 1957	$18,540.77	$3,540.77	$15,000.00

Exhibit "C"
Schedule of United States Treasury Bonds
December 31, 1957

	Series "G"		
	Issuing Date	*Serial No.*	*Cost*
Soil Conservation Society of America, Incorporated	5-47	D3-413413G	$ 500.00
	5-47	M7-609157G	1,000.00
	5-47	M7-609158G	1,000.00
	2-48	M7-609159G	1,000.00
	2-48	M7-609160G	1,000.00
	4-49	M7-609161G	1,000.00
	4-49	M7-609162G	1,000.00
	8-50	M7-455615G	1,000.00
	8-50	M7-455616G	1,000.00
	1-51	M7-736364G	1,000.00
	1-51	M7-736365G	1,000.00
	2-51	M7-738012G	1,000.00
	2-51	M7-738013G	1,000.00
	7-51	M7-788217G	1,000.00
	7-51	D3-486001G	500.00
	2-52	M8-239007G	1,000.00
	Total		$15,000.00

The audit by Peat, Marwick, Mitchell & Co. included only the cash transactions. The following net worth statement including inventories was prepared by the Executive Secretary.

Net Worth Statement
December 31, 1957

ASSETS:	
Cash (Treasurer's Account)	$12,332.49
Cash (Executive Secretary's Account)	447.07
Savings Account	3,540.77*
Treasury Bonds	15,000.00
Supplies	7,784.40
Equipment	3,872.44
Accounts Receivable	1,576.30
Deposit with United Air Lines	425.00
Total Assets	$44,978.47
LIABILITIES:	
Accounts Payable	$ 4,351.12
Chapter Dues Refundable	157.50
Chapter Booklet commissions payable	361.25
Total Liabilities	$ 4,869.87
Net Worth—December 31, 1957	$40,108.60
Net Worth—December 31, 1957	$40,108.60
December 31, 1956	35,359.59
1957 Increase in Net Worth	$ 4,749.01
1956 Increase in Net Worth	$ 69.36
1955 Increase in Net Worth	$10,408.33

*Of the $3,540.77 in savings account, $2,170.00 is from sustaining memberships, $300.00 is set aside for equipment replacement and the remainder of $1,070.77 is accumulated interest on bonds and savings account.

Explanation

The *Society* had a good year in 1957 with receipts totaling $79,703.66 as compared to $56,056.75 in 1956; $71,696.30 in 1955; and $42,721.37 in 1954. Deposits from dues amounted to $40,954.62 as compared to $27,840.88 in 1956; $31,054.63 in 1955; and $20,890.17 in 1954.

Sales of *The Story of Land*, the cartoon-type booklet, amounted to $10,573.06. Total sales of *Society* publications amounted to $14,673.81. Total expenses for publications amounted to $10,470.70 which included $3,137.03 investment in the new booklet *The Wonder of Water* and from which income will be derived in 1958.

Advertising income decreased from $9,194.22 in 1956 to $8,152.33 in 1957. Otherwise, all efforts of the *Society* showed an increase. Membership records for 1957 were carried in the January JOURNAL.

HOWARD F. BARROWS, *Treasurer.*

PHOTO CREDITS

Wisconsin Conservation Department: 53, bottom right; 54, bottom right; 55, top left and bottom left and right; 56, both photos; and cover photo.

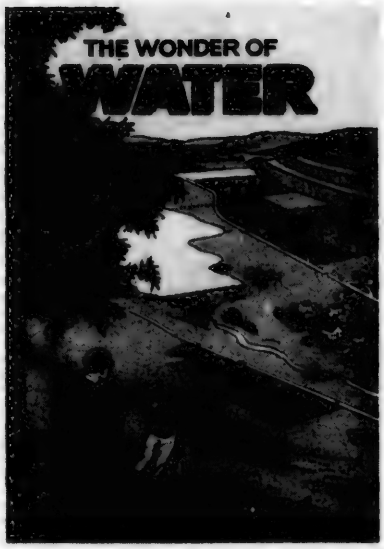
U. S. Forest Service, USDA: 53, bottom left; 54, top left and right; 55 top right; and 82.

Soil Conservation Service, USDA: 57 through 60 (figures 1-5); 62; 63, top right; 67; 68; 69; 70; 73; 74; 79; 80; and 93, upper right.

Caterpillar Tractor Co.: 63, top left.

Iowa State College: 61.

Ramon Kent: 93, center.



"The Wonder of Water"

This newest popular-style cartoon booklet of the *Society* reached a 200,000 distribution before the end of February. A distribution of a million is hoped for during 1958. This goal will be attained through the cooperation of *Society* Chapters, Soil Conservation Districts and business and industry. A million copies probably means a readership of 5,000,000. Out of many letters of commendation, here are a few . . .

• • •

I have received **The Wonder of Water.** In my opinion this is an excellent conservation teaching aid, and I hope it can be well publicized and used in our schools. Its content is both technically and factually accurate; the text is well written and illustrated.

I congratutlate you and the SCSA as a whole on another good job in the conservation education field.

C. W. Mattison, President
Conservation Education Assoc.
Silver Spring, Maryland

• • •

Your booklet, **The Wonder of Water,** was presented to our class and the students are very interested. They expect that it will be very valuable in teaching conservation.

George S. Butler, Head
Dept. of Conservation
and Agriculture
N. Michigan College
Marquette, Michigan

• • •

Our Public Relations Department has shared with me the booklet **The Wonder of Water** that we recently received. May we compliment your *Society* on the production of a very fine piece of literature . . . [we] request some informational literature regarding the *Soil Conservation Society of America.*

G. Robert Harrison, Director
Citizenship Services
Kiwanis International
Chicago, Illinois

• • •

The colorful booklet does an excellent job in presenting the story of water conservation. I will be happy to acquaint our members of its availability.

Donald L. Miller, Director
of Information
National Agricultural Chemicals
Association
Washington, D. C.

• • •

I must congratulate the *Society* on the JOURNAL and **The Wonder of Water.** When I looked into that booklet I had to read every word of it, even though nothing in it was new to me.

Howard S. Miller
Hiawatha, Kansas

• • •

I have carefully reviewed **The Wonder of Water** and feel that it is a useful supplementary reference for junior high schools and senior high schools.

We will announce the availability of this booklet in an early issue of *California Schools.*

Herbert D. Gwinn
State of California
Dept. of Education
Sacramento, Calif.

• • •

Many thanks for letter and **The Wonder of Water.** I have checked through this booklet and have found it very interesting. Congratulations!

L. O. Brackeen,
Director of Publicity
Alabama Polytechnic Institute
Auburn. Alabama

• • •

Many thanks for the fine booklet **The Wonder of Water.** We hope to mention this booklet in the February *Voter.*

Constance Foley
Program Secretary
League of Women Voters
Washington, D. C.

• • •

I think it is very commendable of your organization in bringing **The Wonder of Water** to the public.

Nolen J. Fuqua, President
NASCD
Duncan, Oklahoma

• • •

Congratulations to your Society for producing **The Wonder of Water**—an excellent booklet . . . Water and soil conservation receives great emphasis in the teaching programs of our Audubon centers and camps.

Carl W. Buchheister,
National Audubon Society
New York City

• • •

The Wonder of Water is an exciting tale related in language easily understandable to youngsters and grownups alike. In 16 pages and dozens of excellent four-color drawings the story of water is told with great clarity—greater than has been told in volumes of printed pages.

The wonders of water are endless. Science has not yet revealed all the facts. But this booklet very wisely, and timely, deals with some main facts involved with our everyday lives.

The Wonder of Water should have the widest possible distribution, especially among teachers, youth organizations, conservation agencies and farmers, everywhere.

This is my earnest recommendation after examination of numerous publications across the past several decades.

Hugh H. Bennett
Falls Church, Virginia

NEWS OF MEMBERS

James K. Vessey, assistant regional forester at Milwaukee, will be promoted to regional forester for the southern region with headquarters at Atlanta, Richard E. McArdle, Chief of the U. S. Department of Agriculture's Forest Service, announced Feb. 19. He succeeds C. Otto Lindh who retired February 28 after 33 years of service.

In his new position Mr. Vessey will be responsible for the administration of the national forests in the 11 states extending from North Carolina to Texas and for cooperative work with the states and private landowners in tree planting, fire protection, and technical assistance to small woodland owners.

T. Wilbur "Buddy" Thornhill of Charleston, S. C., an Honorary Member of the *Society,* recently addressed a local garden club on soil and water conservation. "Buddy" had difficulties in getting into the hostess' home. He was carrying a briefcase, and the hostess, thinking he was a salesman, asked him to leave quickly as she had an important meeting and was expecting the speaker any minute. "Buddy" got in, but stated, "in the future I shall be carrying a soil sampler."

There was a most substantial number of *Society* members present at the recent National Association of Soil Conservation Districts meeting February 16-20, Minneapolis.

Charles Theodore Webb, Jr., a member for many years of the Society, and his son Charles E. were killed in a head-on car collision near Mosier, Oregon. Recently he was recognized for his work in South Palouse S. C. District of Washington. Conservationists like Charles Theodore Webb have left some very important landmarks on farm lands across the nation. Through his efforts strip cropping is now a pattern in the South Palouse District.

Charles Holt Gould, a member of the Society and County Agricultural Agent of Camden County, New Jersey, died December 26. He was active in the New Jersey chapter and served as chairman of the education committee.

CHAPTER NEWS

San Francisco Bay chapter met in January on the Berkeley campus of the University of California. Dr. Stephen H. Spurr, professor of forestry at the University of Michigan, spoke on "Soil Classification and Forest Types in the Northeastern United States." The meeting was open to the public.

At its February meeting, Edward I. Kotok (U. S. Forest Service, retired) discussed "The Role of Research in the Land Conservation Movement." Thus the Bay chapter continues its fine "educational" series of background papers.

El Paso County Chapter (Colorado) had standing room only for 115 members and guests in its new meeting hall in December. Major General John G. Van Houten talked on "The Military and Conservation."

Following past custom at its December meeting, the members and guests brought gifts for distribution to needy children. According to Win Caton who sent in the news item and photograph, this was one of the best El Paso chapter meetings to date.

In El Paso "uniform" are guests *(l-r)*: Brig. General Fred Ammerman, Dep. Post Commander, Ft. Carson, Colo., Maj. General John G. Van Houten, Military Commandant, Dist. of Washington, and Brig. General Joseph B. Crawford, Commanding General, Ft. Carson.

Chapter Number 1 (Washington, D. C.) is off to a good start for 1958 with all committees appointed by Chairman Abe Stoesz and moving ahead on assignments. Other new officers for the year are Bill Berry, vice-chairman, and Ted Neubauer, secretary-treasurer. At its January 16 meeting, Dr. Cecil Wadleigh spoke on "Water", disclosing many hitherto unknown facts. Sixty were present.

Florida Chapter reports that at one area meeting seven 3 to 4 minute talks were made on current conservation problems and experiences. The activities committee presented a nine-point activities program for 1958 during the November annual meeting. The chapter will seek additional *Society* members from allied fields of engineering, economics, geography, forestry, wildlife management, fisheries management, education, agronomy, range management, hydrology, sociology and private enterprise.

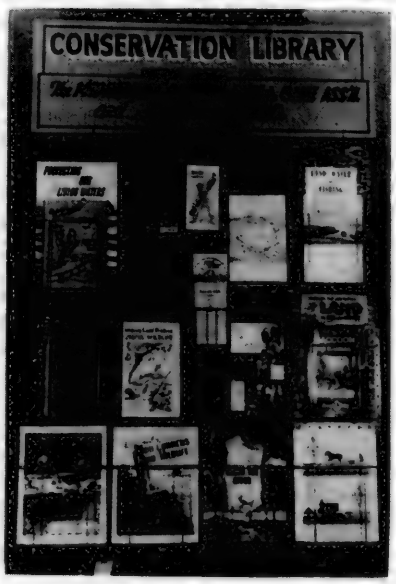
High on the list for 1958 was promotion of speakers (representing the chapter) to appear before school, civic and club groups throughout the state. The chapter chairman will make preliminary contacts throughout Florida and fill requests by assignment of chapter members as speakers.

Georgia Chapter has set aside May 16 and 17 at Rock Eagle Park near Eatonton for its second annual meeting. Members are planning to bring their families to enjoy the remarkable facilities of this outstanding 4-H center and park. Georgia had a quota of 25 members for 1957 and exceeded it by four times. Dan Searcy and E. R. Daniel were the spark plugs, but were ably aided by ten other hard-working members. Chairman Jackson Bennett gets out a nice News Notes to all members. Program for the May meeting has not yet been announced.

Hoosier Chapter (Indiana) centered its annual meeting on January 8 around geology. New officers are Loren R. Johnson, chairman; Ward L. Studor, vice-chairman; and M. M. Merritt, councilman. The secretary-treasurer is appointed. Group transportation to the annual *Society* conference at Asheville was considered. A speakers list and discussion on a conservation training camp were among the business items aired. Elmer Sauer of the national council spoke briefly on *SCSA* affairs. Chapter membership jumped from 37 in 1956 to 128 by the end of 1957—a 349 per cent increase.

Salina Chapter (Kansas) sent in a photograph showing how *Society* publications are being used in a wall panel for distribution to each school in McPherson county through the help of the County Fish and Game Association. Gene F. Bohenblust, chairman of the chapter, is serving on the F. and G. Association's Conservation Library Project committee.

Note the *Society* publications used in this "school Conservation Library."



Old Line Chapter (Maryland) met January 6 in Baltimore. Program for the year, report of national conference and election of officers featured this annual session. Dr. L. Eugene Cronin, director of the Maryland Department of Research and Education, spoke on "The Interrelationship of Our Natural Resources." His topic cut across the interests of all members.

Michigan Chapter met at the Michigan State University for its annual on January 30. Cooperating in the meeting were the Resource Development and Soil Science departments. Up for discussion was a change in Bylaws to enable the election of officers by mail ballot.

The student chapter was presented by Richard L. Weaver. In the afternoon Stanley Cain presided as chairman and Paul A. Miller moderated a panel that considered "Effective Soil and Water Conservation," with roles played by Districts, Extension, SCS, ASC, FHA, and federal-aid for wildlife and fisheries funds. Twelve speakers aided in this presentation. Farley Tubbs spoke on Conservation Education and Frank Suggitt on Resource Development and Extension Program. The evening program involved good participation from student chapter members. Russell Hill, president of the *SCSA*, spoke briefly.

Mississippi Chapter sent in a newspaper clipping showing a photo of bank officials at Tupelo presenting *Society* members with copies of **The Wonder of Water** and other publications of the *Society*. Three banks in Tupelo purchased 1500 booklets for distribution to 4-H clubs, high schools and business men.

Show-Me Chapter (Missouri) has made note of the fact that only 23 per cent of the "professional" soil and water conservation workers in the state belong to the chapter and the national *Society*. About half of the chapter membership have assisted in the chapter program in some definite way.

Wayne E. Chastain sent several ideas to the newsletter. One is the use of personal calling cards listing many services the S. C. Districts have available through the SCS and giving names and phone numbers of the Work Unit Conservationists and Aids.

Another is the use of display boards in all of the banks of the district. In one district, in cooperation with the Extension Service and a Vo-Ag department, darkroom facilities are being used to make photos and to illustrate materials going on the bank display boards.

The December newsletter ran a review of events and accomplishments during 1957—a sort of evaluation.

New Jersey Chapter aired the problems of water rights at its January 29 meeting in Trenton. Present water rights and relation of planning, watershed, irrigation, and future of water rights were the subjects of a panel moderated by Dr. Kemble Widmer, Principal Geologist of New Jersey. Members of the panel were

Senator Wayne Dumont, B. Budd Chavooshian, Kirk Sandals, Oscar Wilensky and Robert Hardman. Dr. Russell B. Alderfer, chairman of the chapter, presided. Host of the meeting was V. N. Thompson, State Department of Agriculture. There were 169 persons attending.

New officers for 1958 are: Neal Munch, chairman; Malcolm Crooks, vice-chairman; Harold Waters, secretary-treasurer; Kemble Widmer, councilman-at-large. The student chapter at Rutgers, with 12 members, has set up its By-Laws and is seeking official recognition at the University.

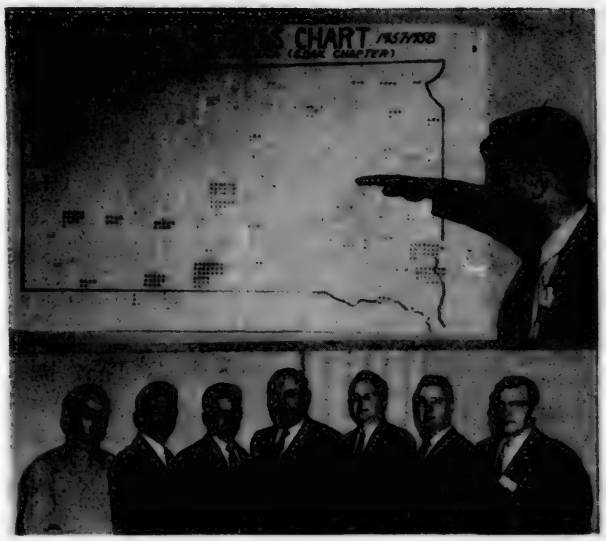
Rio Grande Chapter (New Mexico) met January 6 for its annual. After-dinner speakers included Dr. Robert V. Ruhe (illustrated talk on a Safari in central Africa) and Robert L. Guice (chapter's 1957 conservation award). New officers are Tommy Yager, chairman; Lew Korn, vice-chairman; Charles Diebold, secretary; Walter Mitchell, treasurer; Harry Maker, councilman. The chapter is active in promoting 4-H soil and water demonstrations and gives an annual award of a $50 saving bond to the state winner(s). The 1957 winners are Ernest and Otis Copeland with a soil and water demonstration which has not only been given "alive" to many audiences, but was placed on TV film.

The Empire Chapter (New York) continues to publish a newsworthy *News*. [We note that on one watershed in New York photograph points have been set up to study formation of ice jams at Georgetown.] The February meeting scheduled for Syracuse will center on woodland management with H. G. Wilm chairman. The chapter wasn't bragging when it noted that it stood next to bottom in the 1957 membership campaign, but intends to work harder to keep out of that low-down situation.

North Carolina Chapter, regional winner of the 1957 national activities contest, sent an exhibit to the National Association of Soil Conservation Districts annual meeting held this year in Minneapolis. The exhibit was viewed by over 1200 persons.

East Central Oklahoma Chapter entertained their wives with a dinner on January 17. The chapter will sponsor a "living grass exhibit" at the Muskogee Free Fair. Through such an exhibit many viewers learn much about plants used as food for livestock and soil protection. Clifford Hatcher described his experiences with Point 4 program in Pakistan and Mrs. Hatcher treated the ladies with a display of clothing from Pakistan.

South Dakota Chapter met February 12, 13 and 14 at Sioux Falls with a well-rounded program on wildlife, conservation and TV, watersheds, Great Plains Program, Experiment Station research, address on Russia, soil conservation and soil surveys on Indian reservations, report on nursery, and election of officers. Wayne Pritchard addressed the group; Ross Davies reported on the California meeting and John Loucks on plans for the 1959 national conference. The Rev.



Tom Pozarnsky, S. Dak. Chapter, points out distribution of SCSA members in the State.

S. Dak. Chapter Council *(l-r)*: W. Foss, H. Hiller, T. Pozarnsky (chairman), Ray Lund, M. Strachan, D. Moxen and past-chairman E. Lumb.

Mr. Forred of Vermillion, a Nash award winner in 1957 for outstanding work in soil conservation, was an honored guest and luncheon speaker. There were 210 members and guests registered for this excellent meeting. From all reports, the *Society* members in South Dakota are getting primed for a wonderful national meeting in 1959.

The Olympic View Chapter of western Washington got off to a good start at its January 30 meeting. Ramon Kent presented the charter and a tape recording by President Russell Hill was heard.

Officers are: Vern R. Nelson, Chairman; G. H. Ridder, Vice-Chairman; Carl McMurphy, Secretary; and Lyle Groundwater, Treasurer.

Charter members of the Olympic View Chapter, January, 1958.

Southern New England Chapter (Connecticut, Rhode Island, Massachusetts) held annual winter meeting, February 5 in West Springfield, Mass. Program included, California meeting (Ben Isgur); "Muddy Water" (M. A. Pulchalski); The Conservation Program in the Connecticut Valley (E. R. Foster); The Information Program in the Franklin Soil Conservation District (E. G. Konieczny); Notes on Game and Fish (James Bishop); The Impact of the New Connecticut Turnpike on Southern New England (LeRoy Jones). John Barnard, national Council member, spoke at the luncheon. Program was arranged by M. D. Helfgott.

Inland Empire Chapter (Washington and Northern Idaho), wound up a well-planned year's program at its December 27 annual meeting. Progress was made on all 1957 goals. Twelve members presented papers at the Northwest Scientific Association meetings December 27-28. Awards were given to Dr. Glenn M. Horner for research in soil and water conservation; Glenn Lorang for outstanding radio, TV and publication work in soil and water conservation; Charles Thornson for outstanding work in a FFA conservation project on his father's farm in the Columbia S.C.D.; and to David Wyant for an excellent 4-H soil and water conservation project in the Lower Yakima Valley District.

The chapter intends to increase its activities with youth groups. Alden Copeland, Chairman, Edwin Nurmi, Vice-chairman, and Lawrence Giese, Secretary-Treasurer, are the new officers for 1958.

Wisconsin Chapter held its annual meeting January 24 at the University of Wisconsin. Business, chapter awards and a luncheon warmed up the members for an afternoon discussion on the "Role of Federal Aid in Land-Use Programs" moderated by Art Kurtz. Topics and discussors were: *ACP and Soil Bank* (Ken Hoover); *research* (Bob Muckenhirn); *soil conservation* (Ed Hill); *fish and wildlife* (James Coutts); *forest management* (Roman Koenings); *extension* (Walter Rowlands).

Charter Members of the SCSA

(Continued from the January 1958 Journal)

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When the Soil Conservation Society of America was organized about 1,200 individuals, who had joined by December 31, 1945, were designated Charter Members.

It is natural that the ranks of these early members be depleted through death, illness, retirement from employment in the field, new interests or employment, or just plain procrastination or neglect in keeping up-to-date on dues' payments.

A recent count shows that there are now about 650 Charter Members still on the active roll of the SCSA. It is a pleasure to see these published. We hope that you will find friends on this list with whom you will wish to correspond.

Any mistakes or omissions should be called to our attention at the National office.

★ ★ ★

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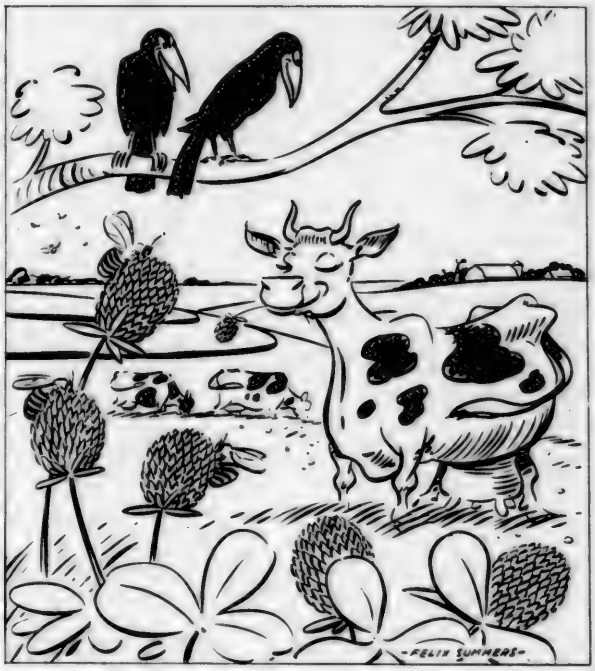

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(To be continued)

NEWS OF MEMBERS

Harry C. Byrd, Honorary Member of the *Society* and past president of the University of Maryland, wrote recently, thanking the secretary for sending on the membership card. He also stated, "Well do I remember the day of organization of the *Society* in Chicago, when I made the main speech. The old man Bennett was a great missionary—and a good organizer. More power to you."

Wilson F. Clark of Billings, Montana, despite a heavy teaching load, a requested book review for the JOURNAL, and secretaryship of the Conservation Education Association, made seven talks to Soil Conservation districts the last week in January.

C. J. Kraebel, chief, Forestry Division, Sino-American Joint Commission on Rural Reconstruction (for Free China) wrote: "I was so busy in 1956 and 1957 that I did not notice I had overlooked sending my check for 1957. Here on Taiwan (Formosa) I have been worrying about how to stop erosion on a grand scale in the foothills of the main range of Taiwan, and in the headwaters of all its streams where the aboriginal tribes still practice a form of 'peripatetic agriculture' on slopes of unbelievable steepness. We have only one soil conservation man in JCRR, but he's good, **Ira B. Landon.** Former SCS man, **Ray Davis** is the only American Commissioner on the JCRR." Landon and Davis are members in the *Society*.

Arch Work of Portland, Oregon, heads up the SCS snow survey section. The section was recently cited by the National Safety Council for operating over a 17-year period without loss of life. Late in January more than 100 snow surveyors attended a safety training course near Jackson, Wyoming.

David Noland of the Haywood county Soil Conservation District of North Carolina was the first supervisor to be sworn into office. Supervisors in this district are now sworn into office.

Winfield S. Harrison of East Lansing, Michigan received a citation from the Michigan chapter for his excellent professional leadership in soil and water conservation.

Washington R. O'Brien, a pioneer in soil conservation among fruit growers in Michigan and first chairman of the Michigan Chapter, was cited by the Chapter during its January meeting.

Herbert Van Aken of Eaton Rapids, Michigan, also received a Michigan chapter "Soil Conservation Certificate of Merit" for his farming efforts and many years of work locally and nationally without pay.

Carl H. Knopf of Muskegon, Michigan was cited by the Michigan chapter for his inspirational leadership in the Soil Conservation District's youth programs.

Robert D. Flannery is with an engineering company as land classification specialist in southern Iraq. Drainage problems seem to be uppermost in this part of Iraq.

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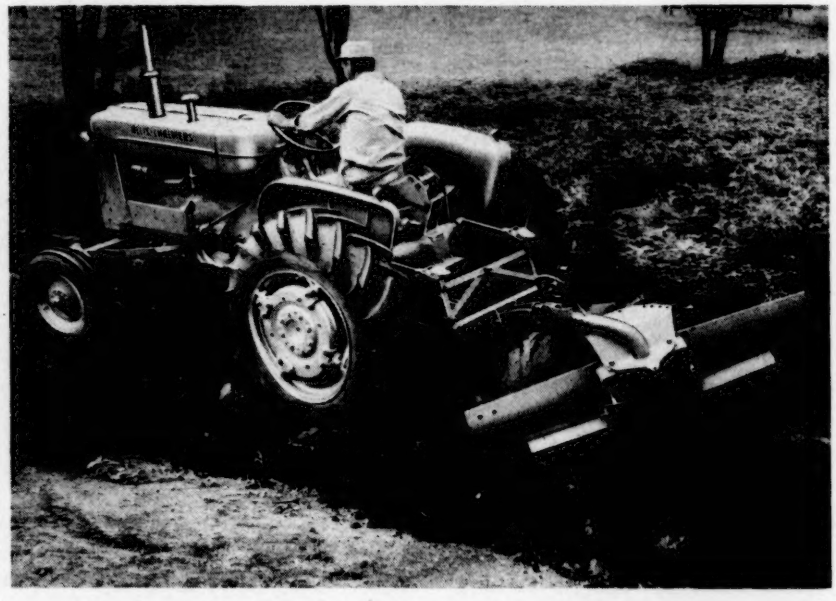

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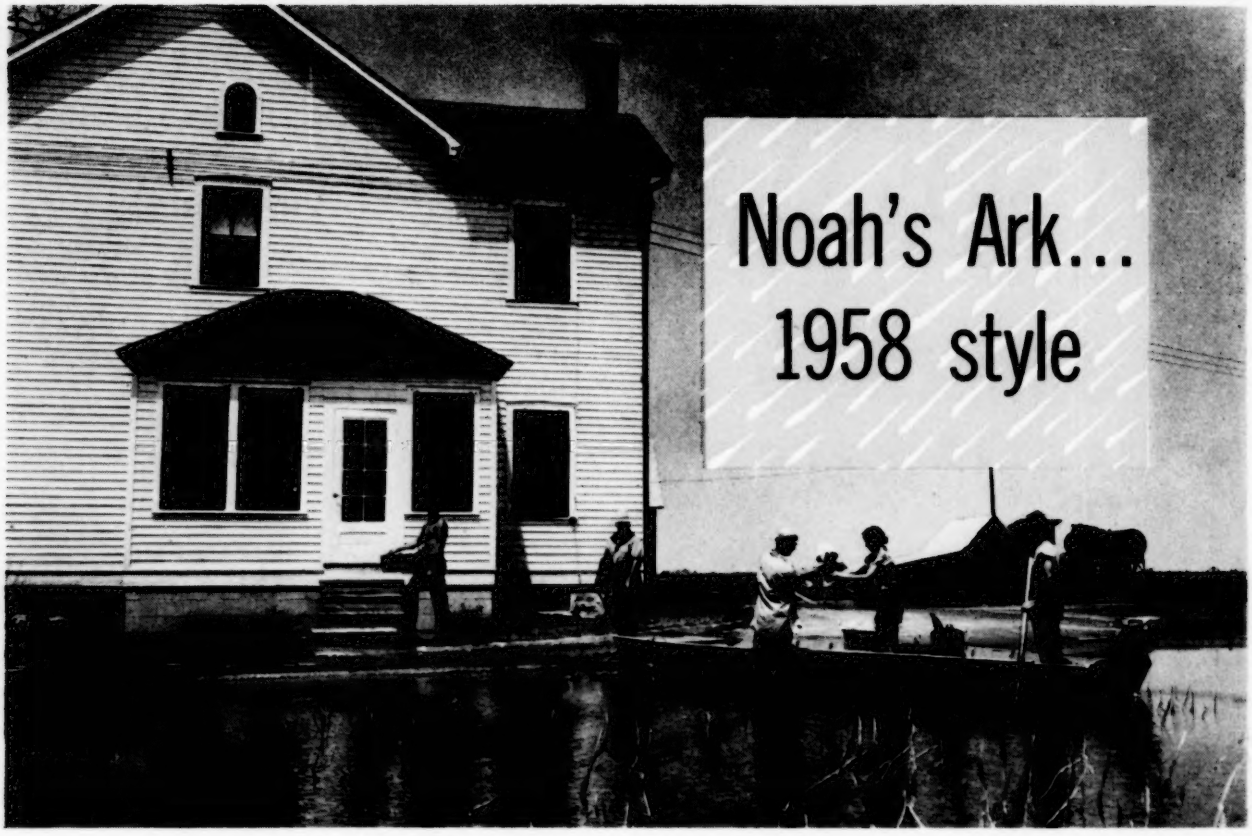

This is the day after the big flood. The water subsides, leaving a sea of mud and debris. Farm families, who bore the brunt of the flood, roll up their sleeves – but they're heartsick. Sure they can clean up, bury their dead livestock, dig out and patch up their equipment. But the flood has done irreparable damage: A year's crop ruined. Deep gullies. Fertile land covered with silt and sand.

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Cat Diesel Tractors building flood control dam on Cow Bayou Creek, Elgin, Texas.

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FACT OF THE MONTH: *U.S. needs 16,000 watershed projects – approximately 296 have been authorized for planning.*

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